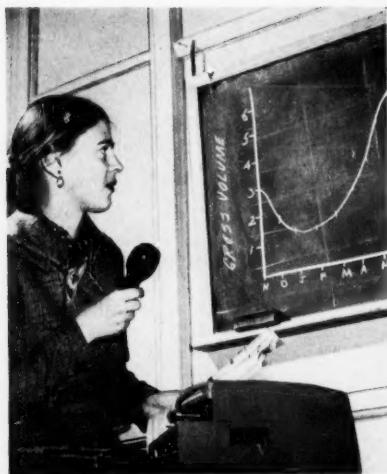


Chemical Week

December 27, 1952

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Fully automatic plants are still far off, but they'll bring both bane and blessing p. 28

Video boom creates a brand-new, multimillion-dollar market for high-purity chemicals p. 36

Plastics set foot on another rung, get set to reach a record high next year p. 48

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Chemical Week

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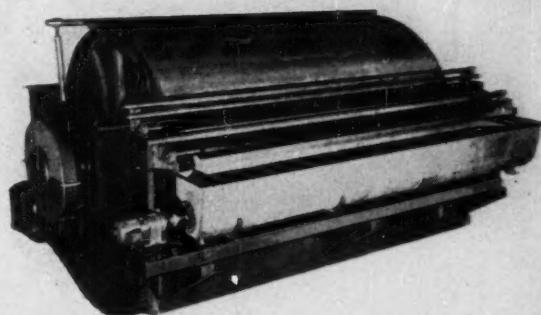
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OPINION . . .



The St. Louis Look

TO THE EDITOR: Monsanto used to have quite a reputation for the handsomeness of its men and the pulchritude of its gals so it is easy to see how your caption writers might put Monsanto's Al Loeffler's name under a picture of Wyandotte's (nee Monsanto) Bob Semple.

The guy with the smile . . . looking at the back of George Merck's neck on p. 12, Dec. 6 is Semple.

Tsk, Tsk, to your caption writers.

JAMES W. IRWIN

James W. Irwin Associates, Inc.
Cleveland, Ohio

TO THE EDITOR: . . . To prove that I read CW carefully . . . there's a pretty obvious error on page 12. (Dec. 6) . . .

The photo of George Merck surrounded by other brass hats in the industry includes Wyandotte's president, Bob Semple, and not Monsanto's Al Loeffler. . . .

R. W. HOOKER
Vice President

Hooker Electrochemical Co.
Niagara Falls, N. Y.

TO THE EDITOR: I should think that a trip around the world would serve

to hush Bob Semple and me adequately. . . .

A. T. LOEFFLER
Director

Development Dept.,
Monsanto Chemical Co.
St. Louis, Mo.

Both CW's editors, and a chastened caption-writer—whose fumble wasn't spotted until more than half our press run had been completed—apologize. Sidelight: Judging from the number of joshing letters and phone calls we received, Bob Semple and Al Loeffler are just as well known to many CW readers as they are to CW's editors.—ED.

Smiling Suede

TO THE EDITOR: Your news article on aerosols for waterproofing fabrics ("Smiling at the Rain," Dec. 6) was very interesting and informative. . . .

I thought, however, that your readers might also like to know of our work in making suede leather—for the garment trade—water-repellent. . . .

We have developed a method of tanning that retains all the normal characteristics of the leather, including feel, color, appearance. . . .

There is little doubt that this de-

velopment of water-repellent and soil-resistant leather has been a prime factor for the sheep suede industry enjoying its best season for the past two decades. . . .

JOSEPH M. O'CONNOR
General Manager
Ronnoco Research Co.
Beverly, Mass.

Highly Aesthetic

TO THE EDITOR: Your long-standing and plainly-expressed opposition to the chlorophyll myth has pleased me . . . and I'm even more pleased now to see that Dr. Alsoph H. Corwin of Johns Hopkins has stepped into the fray . . . with his paper presented at the recent meeting of the New York Section of the A. C. S. . . .

It certainly is high time for the bubble to be pricked. . . .

A. R. HIGHSTREET
Los Angeles, Cal.

A choice portion of Dr. Corwin's indictment: Chlorophyll is indispensable to photosynthesis. It is found to be highly aesthetic in coloring vistas visible from hills and mountains. It furnishes . . . chemists with a lot of . . . fun. For other purposes, we are not certain it has any value."—ED.

MEETINGS . . .

Amer. Society of Mechanical Engineers and Society for Advancement of Management, plant maintenance conference, Cleveland, O., Jan. 19-22.

Society of Plastics Engineers, Inc., ninth annual technical conference, Hotel Statler, Boston, Mass., Jan. 21-23.

Commercial Chemical Development Assn., first 1953 meeting, Hotel Statler, Cleveland, O., Jan. 22.

Compressed Gas Assn., Inc., 40th annual meeting, Waldorf-Astoria, New York, N.Y., Jan. 26-27.

Soap Industry, annual convention, Waldorf-Astoria Hotel, New York, N.Y., Jan. 27-29.

Manufacturing Chemists' Assn., Inc., 1953 industry conference on air pollution abatement, Hotel Statler, Detroit, Mich., Feb. 26-27.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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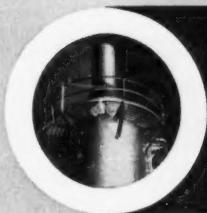
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NEWSLETTER

How does the new year shape up in prospect? Excellent, according to the traditional year's-end predictions. The Manufacturing Chemists' Association sees a somewhat slower rate of production and expansion growth—but growth, nevertheless. It is the belief in continued growth, says MCA's President Charles S. Munson, that sparks current long-range programs to recruit scientific talent.

Spokesmen for industries as diverse as soybean processing and nickel refining look ahead with optimism, expect next year's business to top last year's. Says A. E. Staley, Jr.: "The outlook . . . for 1953 is generally more favorable than it was a year ago." Says International Nickel's John F. Thompson: "Free world nickel supplies are not now adequate . . . The search for new deposits is being pushed at an unprecedented rate."

Even the Controlled Materials Planners looked back at 1952 and saw that it was good. Looking toward next month and the new administration, CMP officials anticipate a program "which will reflect the best thinking of industry and government, will assure the flow of materials to the military, atomic energy and defense-supporting programs without causing dislocations in industry and imbalances in the national economy."

But will the Republican victory—responsible for much business optimism—scare chemical employees into joining the big labor unions?

Many of them are now well satisfied with their wages and working conditions, have been cool toward union organizers. (The chemical industries are less than 50% organized.) But there are straws in the wind:

The heretofore non-union Ethyl Corp. plant at Houston just held a bargaining election. Result: It will be entirely unionized with three AFL unions representing crafts and the CIO Oil Workers representing all other production and maintenance employees.

One might also read significance into the switch by Du Pont workers at the Cel-O-Seal plant (Buffalo) from an independent, one-plant union to the CIO United Gas, Coke & Chemical Workers.

Reconstruction Finance Corporation in its annual report points to three big research results in its synthetic rubber program the past year:

- Oil-masterbatched synthetic has become an established production item "because of a demonstrated improvement in treadwear performance over cold GR-S at a substantial reduction in tire cost."

- A process using the "alfin" catalyst was carried out on a continuous pilot-plant scale. Alfin polymers are described as "extremely tough and yet are free from the degradation constituent known as gel."

- A type of GR-S "approaching cold rubber" in physical properties has been developed which can be made in non-refrigerated equipment."

Chemical trade between Canada and the U. S. is a "one-way" street, says Chemical Institute of Canada's President R. S. Jane, because of Canada's low tariffs and the U. S.'s high ones.

The balance will be somewhat redressed if Dow Chemical Co. makes its point on Canada's ethylene glycol duty. Dow wants to see the

NEWSLETTER

tariff rate higher to protect its \$24-million investment in its Canadian plant. Changing the tariff is a lengthy and involved procedure, but Dow has now hit upon a simpler, faster approach: merely move glycol out of the "free" paragraph, under which it now enters into one of two other equally applicable paragraphs, the items under which carry a 20% duty.

Dow will present arguments to the Tariff Board on Jan. 12 to justify the change. Since this approach makes the tariff a matter for definition, not for legislation, speedy action should result.

Steps are also being taken in Canada to solve the predicament of the orphan child, Canadian Industries, Ltd., whose parents—Du Pont and Imperial Chemical Industries—have been ordered by a U. S. Federal District Court to disown it. Since the judgment wasn't appealed, Du Pont and ICI (which each owns about 42% of CIL's stock) must file by Jan. 30 a plan to end their joint interest in the Canadian firm.

Now CIL stockholders have been advised of a tentative plan to divide CIL into two separate firms, one largely owned by Du Pont the other, by ICI. Present preferred and minority common stockholders of CIL would be given stock in both of the new companies.

The plan has several hurdles to clear: First, it must be approved by the U. S. court; then, CIL's board of directors will have to make sure that minority interests are protected; then, CIL's stockholders will have to give their okeh; and finally, it must be sanctioned by a Quebec superior court judge and confirmed by the secretary of state of Canada.

While Du Pont was busy reshaping its set-up to fit the Justice Department anti-trust blueprint, it paused a moment to chide the self-same department for its inconsistent publicity policy. With a loud shout, it indicated Du Pont and several other defendants back in 1948 for allegedly fixing prices of wood finishes. With not even a whisper, it withdrew the indictment last month.

Hearings on the Niagara Falls power rate controversy (CW Newsletter, Dec. 20) reveal that cheap power was a factor in the decision of Buffalo Electro-Chemical to build a plant at Vancouver, Wash. The firm's director of engineering, George Crewson, told the Public Service Commission that locating in Vancouver saved \$124,000 a year—or 3½% on the investment. He further testified that the proposed rate increase would cost the Buffalo plant an additional \$90,000 a year.

Companies fighting the rate increase contend that the power company is using an inflated working capital requirement as a basis for requesting higher rates. They say that the lag between collections for customers and payment of federal taxes provides considerable working capital to the utility firm.

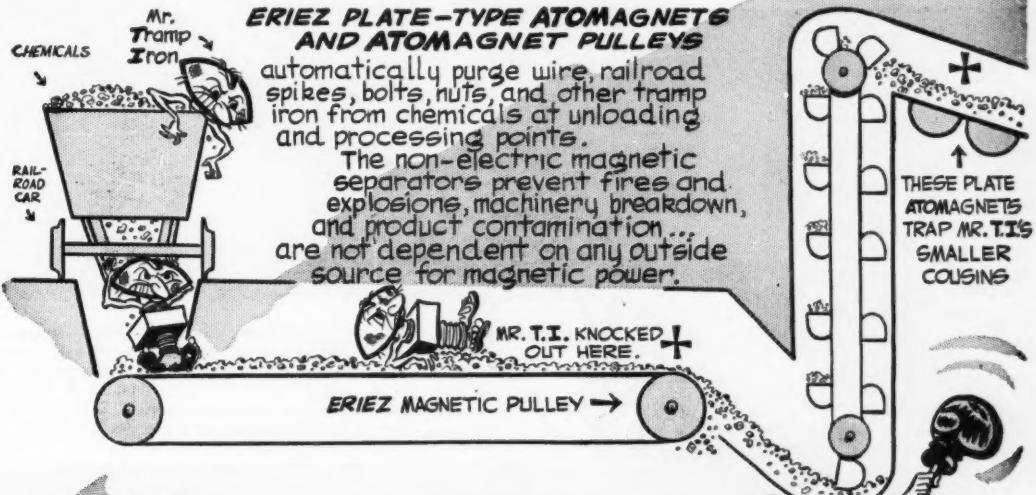
A generation-old tradition will be broken this year when the "chem show," long a biennial winter feature at New York's Grand Central Palace, moves to Philadelphia's Commercial Museum. Reason: the Palace has been taken over by the U. S. Treasury Department. The chem show date remains unchanged, however; it's still Nov. 30-Dec. 5.

... The Editors



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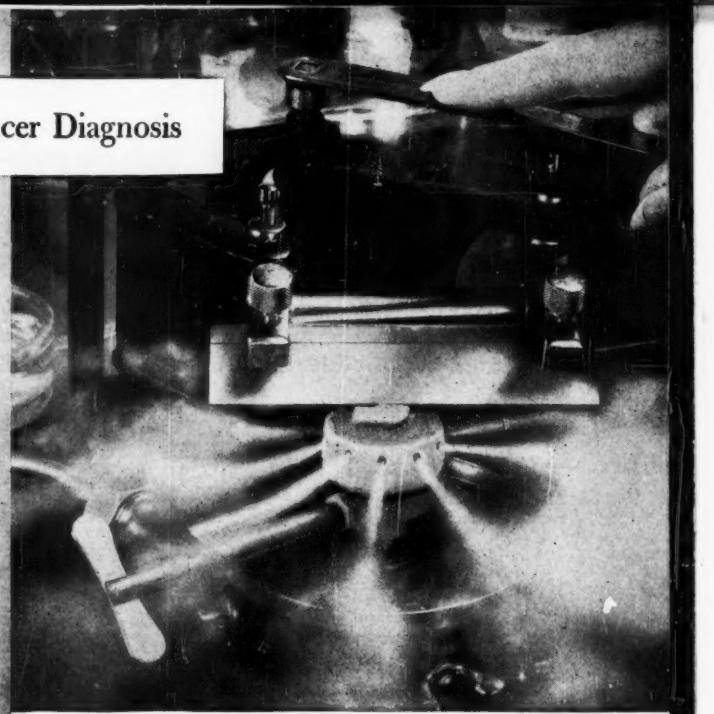
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PROBLEM: Cancer Diagnosis

PROBLEM: To breathe clean air in a foul room

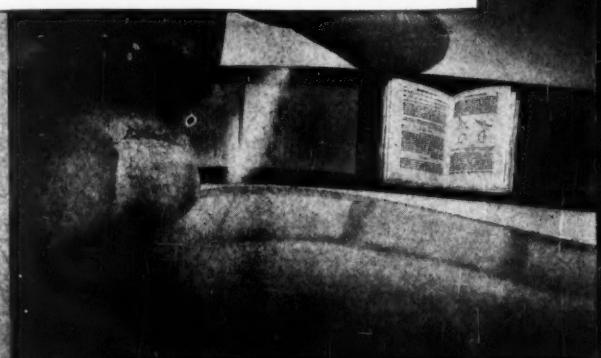


ANSWER: Trapping dusts as small as 24 millionths of an inch in diameter is now possible by American Optical's revolutionary new respirator filter. This chemically treated filter has 40 times the efficiency of similar untreated filters, does work of filters 8 times as large, yet is no harder to breathe through.



ANSWER: Is it cancer or not? While the patient lies on the operating table, pathologists can look at a microscopic slice of human cell tissue and find out. First, the tissue is frozen by carbon dioxide gas, then is sliced by a *microtome* to an incredible thinness of 12 microns (.00048 inch). Once the finest microtomes came from Europe. American Optical has long since equaled and passed their precision.

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ANSWER: Books and records, too valuable to lose, are now copied on tiny film, saving time, shelf space, money. American Optical's microfilm "reader" enlarges to natural size and clearly projects the microfilm. These flat, undistorted, projected images may be read comfortably for hours. Write us about your development problems. Address American Optical Company 62 Vision Park, Southbridge, Mass.

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BUSINESS & INDUSTRY

Lawsuit Catalyst

Agreement to strive for brevity and relevance in presenting evidence may serve as a "reaction chemical" to speed up the Government's antitrust case against Du Pont, General Motors, U.S. Rubber and 117 individuals.

Also agreed to during the pre-trial conference in Chicago's U.S. Court House: Motions and stipulations introduced on behalf of any defendant can be equally binding on any other defendants if they don't except themselves.

By reading into the record only "pertinent excerpts" instead of the entire eight volumes of 1,203 documents offered as evidence, the Government attorneys may be able to present their case in six weeks or less, instead of the "up to six months" originally estimated.

Taking over as top lawyer on the Government's team when the trial resumes on Jan. 5 will be E. Houston Harsha of the Justice Department's Antitrust Division. Harsha is subbing for Willis L. Hotchkiss, whose illness led to the 35-day recess in what has been billed as the biggest antitrust case in history.

Lengthier Yardstick

Starting next month, chemical wage rates geared to the cost-of-living will have to be figured on the basis of a "yardstick" that will be 67% longer and—the Bureau of Labor Statistics hopes—more accurate than the present units for measuring food, clothing and shelter expenses.

After three years of study, BLS has decided exactly how it will revise its consumers' price index. Principal changes approved by Labor Secretary Maurice J. Tobin:

- The base period will be moved up to the post-World War II era. Up to now, price changes have been based on "1935-'39 average equals 100"; the new base will be the average for 1947-'49.

- Instead of sampling prices only in 34 large cities, BLS now will check price tags in 46 communities, including 26 medium and small cities.

- Number of consumer items priced will be upped from 225 to 300, and the list will be modernized; e.g., nylons instead of silk stockings.

- Relative importance or "weights" of the various classes of goods and



TOBIN: For nylons and beer, recognition at last.

services are altered; for example, food costs now will make up only 33% instead of 41% of the total.

Because 100 points on the new scale equal 167.2 on the old scale, the new cost-of-living index will be lower to start with and slower moving. Last October's average for the nation was 114.2 on the new scale or 190.9 on the old. Companies that have escalator clauses in their contracts can expect to hear from their union negotiators soon; Walter Reuther of the United Auto Workers (CIO) is reported anxious to talk things over with General Motors about re-jigging their wage formula.

Feeding the Fire

The debate over the powers of the Food and Drug Administration (CW, Dec. 20) is still flaming.

But now, the argument is limited more to the specific question of FDA's inspection powers. Late last week, FDA officials decided on their course of action—they will ask Congress for a simple change in wording to replace the portion of the Food and Drug Act which the Supreme Court found ambiguous.

Commissioner Charles W. Crawford has proposed that the law be changed to require a food and drug inspector, on entering a plant, to give written notice to management of his intention to inspect the plant. This

would not be an advance notice. Permission would not be necessary before entry.

Crawford emphasized that, in the immediate future, "I am not anxious to consider any change except that required to restore its [the law's] validity. Such changes would undoubtedly provoke controversies and delay enactment."

In short, FDA only wants back the powers it thought it had for the past 14 years.

Easy Change? Can FDA get what it wants? That's still debatable. The Republican and Democratic members of the House commerce committee, which handles such legislation, are noncommittal or lukewarm to quick action.

FDA does have allies of a sort in its campaign. The American Drug Manufacturers Association, the American Pharmaceutical Manufacturers Association and the Toilet Goods Association have said they would back such a law change.

Other groups, as well as individual manufacturers and processors, will undoubtedly be heard from. But all will probably not be amenable to FDA's wording change, and will want a more specific outline of FDA power. AMPA, for example, is planning to recommend an inspection amendment to "provide due safeguards and qualifications against a misuse of this authority."

Still Unanswered: The inspection matter is, in effect, a prologue to the larger battle looming over food additives. It's still a moot question as to whether any legislation will be passed in 1953 on this subject. And FDA, wanting a quick affirmation of its inspection powers, may find itself delayed not only by groups which want FDA's inspection powers spelled out exactly, but also by legislators who want to consider every food law matter simultaneously.

Water for Growth

Corpus Christi may have found the answer to the main problem that has hampered its industrial expansion: its water requirements.

The voters of the city and the Lower Nueces River Supply District have given their blessing to the issuance of \$15.5 million in bonds for the construction of Wesley E. Seale Dam, which, when completed, is ex-

BUSINESS & INDUSTRY

pected to give the area adequate water storage for over 25 years.

Construction is scheduled to get under way "as soon as it is humanly possible."

FOREIGN

Cellulose/Germany: The Kalle works, transparent cellulose sheet makers, formerly part of the IG Farben chemical combine, has been established as an independent successor company despite opposition from the West German chemical industry. The move received support from both the West German government and a special committee of German industrialists named to investigate the soundness of the split-up.

Pulp Imports/Japan: Japan is scheduled to import 28,000 tons of pulp from Canada, Finland and Sweden, valued at over \$5 million, through its October-March foreign currency budget.

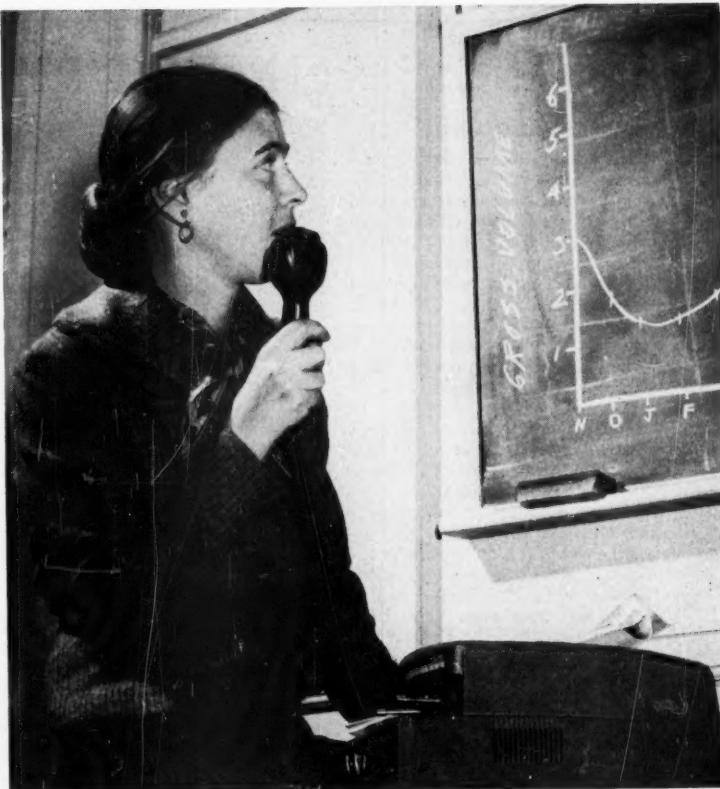
Reflecting the increase production-wise, provisional statistics show that output in October will set a new record in the Japanese paper industry.

Fertilizer/Japan: October production of chemical fertilizers continued to show an over-all rise, according to the Japanese Economic Policy Board, despite the fact that the industry is now holding surplus stocks. Output of ammonium sulfate and calcium cyanamide showed production increases, while output of superphosphate declined.

Soap and Detergents/Venezuela: A large expansion program has been undertaken by Las Llaves, Venezuela. Procter & Gamble, which opened the first detergent plant in Venezuela last June, has vaulted into top sales position in the country with the production of "Ace" for laundry and dish-washing use.

Paint/Venezuela: New paint factories have been constructed in Venezuela, notably the Tucan plant of the Zingg Bros. Co., Antimano. Montana Paints also recently has installed machines to complete manufacture of cans, the ready-to-assemble product being supplied by the Intercontinent Co.

Pesticides/Mexico: Stauffer de Mexico's new pesticide plant at Nogales, Sonora, is now in operation. Although this is the first Stauffer plant to be built in Mexico, Stauffer pesticides have been marketed there for eight years.



WOMEN IN INDUSTRY: They administrate . . .

More Women . . . in More Jobs

Rationalizing any kind of theory regarding the utilization of women in chemistry is like holding a goldfish. The tighter grasp you think you have, the more elusive it becomes.

Out of all the figures and facts, however, arises one indisputable truth: In all sectors of the chemical industry, the percentage of women employed in technical capacities is rising. For better or for worse, one out of every thirteen chemists in industry today is a woman (contrasted against a 1940 ratio of one in every forty).

Figure Breakdown: Broken down, the figures tell the story even plainer:

- Percentile concentration of women chemists is heaviest in the younger age groups, where one out of every six chemists boasts of having feminine gender.*

- The activities of women in chem-

istry tend most generally to be in the fields of research, design, or development, rather than in service or sales departments.

- Their proportional placement in the chemical industry varies considerably—from heavy quotas employed by the drug and medicine companies to relatively few engaged in the manufacture of fertilizers.†

- In respect to the chemical engineering profession alone, an overall breakdown points out that only 16% of all women engineers are chemical engineers—a poor third runner behind both mechanical and electrical engineering. (There are, however, better opportunities for the woman

* Data from the U. S. Dept. of Labor, Monthly Statistical Report, "Employment and Payrolls."

† Left, Beatrice Hicks, v.p. and chief engineer, Newark Controls Co., Newark, N.J.; center, Evelyn Jetter, U. S. Atomic Energy Commission; upper right, Roslyn Keller, Alpha Metals, Jersey City, N.J.; lower right, Sophia Voskerchian, Bingham Pump Co., New York City.

* From a recent survey, conducted by the National Scientific Register in cooperation with the American Chemical Society and the Bureau of Labor Statistics.



they research . . . they engineer . . . they sell



with More Confidence

chemical engineer than for the woman chemist, according to the Society of Women Engineers.)

With the single exception of the small group of women chemists over 40 years of age (where a Ph.D. was found more commonly than a master's degree) the characteristic graduate degree for women is the M.S. (Only 14% of all women chemists in the National Scientific Register have Ph.D.'s as compared to 24% of the men, and in 1952, only 4% of the total Ph.D.'s awarded in chemistry were reported granted to women.)

And What it Leads to: If advancement in a profession is to be measured in terms of top earnings—salaries paid to directors of research, laboratory heads, etc.—very few women have hit pay dirt. When they have, however, the results, according to the Department of Labor, have been highly satisfactory. The hump once passed, and the ability to produce results having

been proved, smooth sailing ahead is virtually assured.

The snag develops for most women after the five- or six-year breaking-in tenure. Seldom is she channeled out of the initial laboratory niche, as are her male counterparts, to sales or administration, unless by dint of unusual drive or outstanding developmental work.

Opportunities for advancement into managerial positions, when they do materialize, occur most frequently in smaller firms. Relatively few women are in these positions today, but their number is steadily mounting. As consolation meanwhile, salaries on any grade level in chemistry are generally higher than those for women in other professions.

Nevertheless, the bitter pill remains. Projected against the salaries paid to men of comparable age and educational background, the gap in earning power yawns widely. That

very disparity, laid to the limited opportunities and advancement tendered to women, is the main bone of contention that distaff chemists pick with industry. They usually start on equal professional footing with men, but somewhere along the way prejudice interferes with normal progress—both salary-wise and in terms of promotions.

On Whom the Onus Falls: As in the case of all such contentions, it depends on whom you talk to. Clear, cool optimism springs from many women happily engaged in their chosen work. They see prejudice "gracefully retiring" with the passing generation.

Resentment—the product of personal disappointment—is the bitter crop others have reaped. Enlightenment has not seeped through to their benefaction, they feel, and they chafe at the bonds.

Few charges of discrimination are leveled at U. S. government agencies, however. Nor, in some cases, to particular chemical corporations renowned for their pioneering in utilization of women chemists as a source of unexploited talent.

Girding for the Future: The high level of scholastic and professional ability displayed by graduate women chemists today is undoubtedly a powerful potential influence on the growth curves yet to come. Recent studies of the membership of the American Chemical Society reflect the mounting trend. In 1952, approximately 6% of its members are women, with enrollments steadily rising.

Plugging for increased interest in chemistry among high school and college girls, and promoting the advancement of women to higher levels in research and industry, are such societies as Iota Sigma Pi—the national honor fraternity for women in chemistry. Its objectives:

- To inform the public of the pool of qualified women chemists;
- To engender their acceptance in industry;
- To encourage more "to join the party."

An encouraging note marking the effect of such propagandizing comes from J. H. Howard, Secretary of the Committee on Professional Training, American Chemical Society. He finds that between 1947 and 1952 over 13% of those persons found to have met the requirements in undergraduate chemistry in ACS-approved schools were women.

Therefore, with a growing attention focused on means of satisfying

BUSINESS & INDUSTRY

industry's technical shortages, utilization of womanpower seems a sure bet. The need, coupled with suffragette-like militancy, places women chemists in an advantageous bargaining position.

Their first big chance to close the ranks came during World War II; and once launched, they have picked up both momentum and supporters. Past performance and present conditions point to only one prediction for the future: From any angle, the position of women in the chemical industry of tomorrow looms challengingly.

EXPANSION

Uranium: Vanadium Corp. officials plan construction of a uranium mill at Hite, in southeastern Utah, at an estimated cost of \$1 1/2-\$3 million. Vanadium Corp. now claims to have solved the problems connected with milling copper-uranium ores.

Tall Oil: Newport Industries Inc., Pensacola, Fla., is planning a \$6-million plant expansion to take the form of a new oil refining plant at Bay Minette, Ala., and expansion of research facilities in Pensacola.

The new plant will process black liquor skimmings and crude tall oil into the tall oil used in manufacture of soaps, detergents, paints and varnishes.

Rayon: American Enka Corp. will expand its facilities for the production of viscose textile yarn at Lowland, N.C. Work on the program is expected to start immediately and to be completed by the end of 1953.

Benzene: Standard Oil Co. of California's \$10-million plant at the El Segundo, Calif., refinery is nearing completion. A substantial portion of the benzene output at El Segundo will be used as a feed stock for a new \$4-million phenol plant at Standard's Richmond, Calif., refinery.

COMPANIES

Stauffer/Consolidated Chemical: Consolidated Chemical Industries, which owns and operates eight plants, has notified the Securities and Exchange Commission that its control has passed into the hands of Stauffer Chemical Co., San Francisco. Stauffer had previously owned 40,000 shares of Consolidated's Class B common voting stock, or half the shares outstanding. With the purchase of an additional 35,660 shares, it now owns 94% of the Class B stock, which is not listed on any exchange.

Consolidated's Class A cumulative participating preference stock is listed on the San Francisco Stock Exchange, and is a non-voting issue.

National Lead Co. has just recently completed plans for the acquisition of the assets and business operations of Doeher-Jarvis Corp. The business will be operated as a division of National Lead, and will result in the distribution to Doeher-Jarvis stockholders of National Lead common stock on a basis of 1.15 shares for 1.

E. I. Du Pont Co. has revealed plans to build a \$3-million fiber laboratory outside of Kingston, N.C., to perform research on the company's new fiber Dacron. Scheduled for completion late in 1954, the laboratory will go up on the site of Du Pont's \$40-million plant now under construction.

Houdry Process Corp. and its foreign representatives, World Commerce Corp., S.A., N.Y., has stated that the Daikyo Oil Co., Ltd., Tokyo, will install a Houdriflow catalytic unit at its Yokkaichi, Japan refinery. The new Houdriflow is the first to be installed in the Orient.

Olin Industries is reported to be still considering Arkansas as the site for its proposed \$170 million alumina and aluminum plant, provided that Arkansas can meet the competition of other states in the matter of fuel, water, and transportation (CW, Nov. 29; Dec. 6). Surveys of several locations have been made, and Olin officials have expressed a definite interest in a midcontinent, Mississippi Valley site.

Financing news was also active:

• **Noranda Mines, Ltd.**, has completed arrangements for new financing in the amount of \$30 million. Of this, \$20 million is in the form of a 15-year 4 1/4% callable sinking fund debentures, and the balance takes the form of a revolving bank credit which does not require any mortgage or charge on the company's property. The new financing will be used to provide funds for the new sulfur-iron plant to be built in the Niagara Peninsula, to lend funds to the subsidiary, Gaspe Copper Mines, Ltd., and to lend funds to a new company in which Noranda will have a 51% interest.

• **Falconbridge Nickel Mines** has now largely finalized financing of its expansion program with the Export-Import Bank in Washington with the announcement that a credit of up to

\$5 million has been granted. When expansion has been completed, the company will be able to turn out at least 35 million lbs. of nickel annually as against a prewar rate of 20 million lbs. and a current level of about 28-30 million lbs.

• **National Starch Products, Inc.** has borrowed \$2 million from Connecticut General Life Insurance Co. through sale of 3 1/4% debentures that mature July 2, 1967. Proceeds will retire about \$1 million of outstanding debentures and add to the company's working capital.

• **Reynolds Metals Co.** has earmarked \$5 million for working capital by selling 4% notes to a group of four banks. Its report to the New York Stock Exchange stated that the borrowing has ended a \$17.5 million credit arranged last March with Bank of the Manhattan Co., First National Bank of Chicago, Bank of America and Manufacturers Trust Co. The loan will be due March 1, 1954.

• **Kaiser Aluminum and Chemical Corp.** has sold the first batch of bonds—\$14.5 million worth—under a \$29 million arrangement set up with a dozen institutional investors last January. The first mortgage bonds will mature in 1976 and will carry a 4 1/4% interest rate.

Proceeds will be used to help finance Kaiser's expansion program.

• **Phillips Petroleum Co.** ran out a \$75 million credit when it borrowed \$20 million from a group of thirteen banks, headed by National City Bank, N.Y. Proceeds will be used for general corporate purposes.

• **Davison Chemical Corp.** took another \$5 million down under a \$19.3 million credit set up last March with Metropolitan Life Insurance Co. Proceeds will be used for expansion.

• **Seiberling Rubber Co.** has placed 75,000 shares of additional common stock on the market. The price: \$10.75 a share. Proceeds will be added to Seiberling's working capital.

• **Sinclair Oil Corp.** stockholders have cleared the way for a \$101,758,900 issue of convertible subordinated debentures—largest piece of debt financing in the firm's history. Sinclair stockholders themselves will get first crack at the issue which comes due Jan. 15, 1983. For each 12 shares of the company common stock held, a stockholder will be allowed to buy \$100 worth of debentures. Of the almost \$100 million which Sinclair will net from the sale, \$40 million will be used to repay bank loans, which financed a large share of company expansion up to now; the other \$60 million will go to future expansion.

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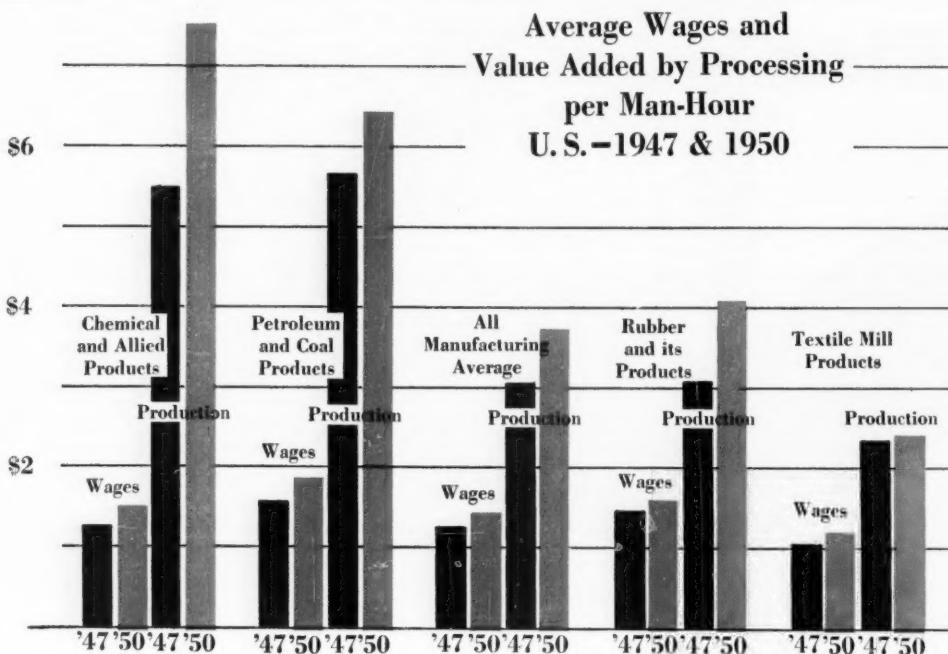
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CPI Shines As Productivity Paragon

One reason the manufacture of chemicals and allied products is such a flourishing industry is that its technological know-how has made it the nearest thing in this world to a "push-button business."

Recently released figures from the latest census of manufactures show that:

- Because of its high degree of mechanization, the chemical processing industry has the lowest relative labor cost in the nation.

- Because of its plant operating efficiency, the CPI boasts the greatest amount of production (value added to products by manufacturing or processing) per man-hour.

- Because of incessant improvement in design of plants and equipment, the CPI enjoyed what was probably the greatest increase in production per man-hour between 1947 and 1950.

Wages Not Burdensome: Although the country's chemical companies have been paying wages consistently above the average for all manufacturing industries (5½% higher in 1950, 1.8% higher in September 1952), the rising

cost of labor hasn't been the drag on CPI growth that it has been on growth of other industries. This is because most chemical processing firms have installed up-to-date equipment that can be operated by a relatively small crew of trained production workers.

According to the new report from the U.S. Bureau of the Census, chemical concerns paid their production workers a total of \$1,470,795,000 in 1950, and the difference between the value of these companies' raw materials and their finished products was \$7,236,618,000. Thus, cost of labor in chemical processing may be placed at 20.4%. How this figure stacks up alongside corresponding percentages for other industries is shown in the chart at the top of p. 16.

Among major segments of the CPI, makers of soap and related products have the second highest wage rates but the lowest total relative cost for production labor, just 15.5% of value added by manufacturing. Fertilizer manufacturers, paying next-to-lowest wage rates in the CPI, have the highest total relative cost for production labor, 31.5%. Other branches of this

industry had these ratios of production wages to value added by processing: toilet preparations, 13.6%; insecticides and fungicides, 15.7%; synthetic rubber, 16.2%; plastics, 19.9%; paints and other protective coating products, 21.8%; cyclic coal-tar crudes, 23.7%; synthetic fibers, 24.0%; vegetable and animal oils, 24.7%; gum and wood chemicals, 25.9%; alkalies and chlorine, 26.5%.

Productivity Factor: Dividing the "value added by manufacture" by the total number of man-hours worked gives a measure of productivity on the part of individual employees. In the case of the chemical companies of the U.S., this ratio increased by 38.1% from 1947 to 1950, compared to a 23.5% average increase for all manufacturing industries, as shown in the chart at the top of this page.

This trend toward higher productivity has been cited by labor union spokesmen as grounds for proportionate increases in wages. The two sides of this argument might be summed up like this:

- Production workers can't claim much credit for the productivity rise,

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Production Wages as percentage of Value Added by Manufacturing

40 U.S.-1950



because most of that increase—if not all—is due to technical and mechanical improvements, made at the stockholders' expense.

- Whether the production worker is handling chemicals with a soup ladle or a million dollars' worth of apparatus, if his output goes up, his worth to the company keeps in step.

Soap Is Tops: On this productivity scale, soap and detergent companies rank first in value added per man-hour, not only within the chemical processing industry but also among all the 109 major businesses in the U.S. economy. The soap makers' productivity came to \$11.03 per man-hour in 1950, more than 35% better than the next best mark of \$8.15, which also belonged to a chemical business—industrial organic chemicals. Two other chemical branches ranked among the top seven businesses in this respect, paint and allied products with an average of \$7.12 and industrial inorganic chemicals with a \$6.42 standing.

Productivity figures for other chemical lines, in value added per man-hour: vegetable and animal oils, \$4.57; gum and wood chemicals, \$4.09; and fertilizers, \$3.45.

Throughout the nation's 109 largest manufacturing businesses, the one with the slowest production rate (or, the lowest value added to products per man-hour) was the making of handbags and other small leather goods, in which productivity averaged only \$1.66/man-hour in 1950.

Orchids for All: One conclusion that may be drawn from the Census Bureau's figures and the productivity ratios derived from them: CPI personnel on all levels have been doing their work well—management has

chosen products with ready market value and has picked capable people to do the various jobs; scientists have worked out sound processes, engineers have designed plants and equipment for high efficiency, and production employees have made good use of the equipment. All these are logical in framing an explanation for the chemical industry's supremacy in productivity and economical use of manpower.

But there's no reason to suppose that the competitive situation will remain fixed and static, with the chemical industry always far in front of the pack. Labor costs of 20% may permit fair profits now, but in the near future, with rival companies mechanizing like mad, a 20% labor charge might force a firm out of business.

LABOR
Unions Go Capitalistic: Signs of the times in the labor union movement within the chemical processing industries this week:

- In Chicago, members of International Chemical Workers Union (AFL) Local 241 gave a dinner for their bosses, the management of S. Buschbaum & Co., manufacturers of plastic products. Sitting together in chummy camaraderie, unionists and company officers exchanged compliments on the firm's having received a gold medal award and new government contracts for its products; some of the credit for these successes went to the labor-management "quality committees" that see to the quality of the firm's production.

- In Paducah, Ky., two of the AFL unions helping to build the atomic energy plant have been trying to out-

do each other in grandeur of equipment. When one union's business agent was seen driving a Chrysler, members of Sheet Metal Workers Local 110 chipped in to help their business agent buy a \$5,487 Cadillac. Most of the 900 members contributed \$5 each, but the business agent assures the press that there's no hard feelings toward the men who gave nothing.

- In New York, stock market sources report that some labor unions have begun (secretly) to buy corporation stocks, particularly through mutual funds. Up to now, many unions have invested their funds in government bonds, but common stocks seem to offer higher returns and a hedge against inflation. One question posed by this move: Would a union strike against a company if the union held several fistfuls of that company's stock?

Benefits for Bed-fast: One of the more important union contracts in the chemical news this week:

- Columbia-Southern's new contract with the AFL Machinists, covering some 300 hourly-paid employees in the plant at Lake Charles, La., includes wage increases averaging 12¢/hour plus incorporation of 8¢ cost-of-living bonus into base rates; 6¢ and 12¢ shift differentials; a union shop; and a \$70/week maximum sick-leave plan. Fringe benefits are expected to cost the company 18 1/4¢/hour. All economic benefits are subject to WSB approval.

- National Lead has signed new contracts with two local unions of Gas-Coke covering employees in two divisions of the firm. Those in the Delore Division are to have an across-the-board 6¢ rise plus an additional 5¢ for operator classifications, eight paid holidays, and future wage adjustments under an escalator plan; workers in the Lead & Oil Division are down for a 4¢ hike, seven paid holidays, premium pay for Sunday work and \$1 lunch allowances. Both groups will get two-week vacations after three years instead of five.

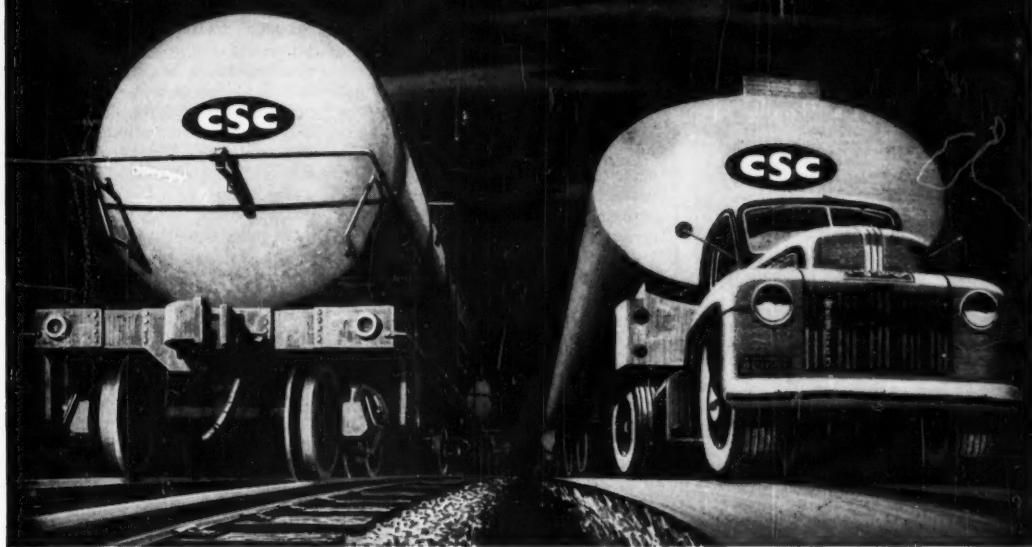
- American Plastics Co. and the AFL Machinists have agreed on a one-year contract with wage increases ranging from 5¢ to 12¢/hour.

Glassworkers' Grievance: Among the cases in which labor relations are at sixes and sevens this holiday season:

- At Detroit, federal and state conciliators have been working to settle a strike of 200 glassworkers employed at 40 glass companies in southern Michigan. Another 300 glaziers have refused to cross picket lines. The AFL

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BUSINESS & INDUSTRY

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Glaziers & Glassworkers Union is asking a 15¢ increase, the companies are offering 10¢

• Another 350 workers are idle at Olive Hill, Ky., where the Brick & Clay Workers of America are on strike against General Refractories because of a dispute over which of two tow-motor operators should receive 3 hours' overtime pay. This stoppage came one month after the end of a three-week strike at the same plant.

• In an all-union court battle in Paducah, Ky., Local 181 of the AFL Union of Operating Engineers and one of its officials have been held in contempt of court for failing to produce in court certain union records. The union is being sued for \$3.25 million by a group of former members who say they weren't given a voice in union affairs and couldn't get an accounting of union funds. About 1,000 operating engineers attended the hearing, causing a shutdown of construction work on the atomic energy plant.

• Also impeding progress at the Paducah atomic plant is a four-month strike by CIO United Steelworkers at the American Locomotive plant in Dunkirk, N.Y., where essential nickel tubing is manufactured. President Truman has invoked the Taft-Hartley Act to get production resumed, but the union reportedly plans to challenge the applicability of that law.

LEGAL

Soap Maker Fined: Missouri's state antitrust laws prohibit price-fixing agreements between manufacturers and distributors, the state Supreme Court reminds this week in approving a stipulation that Armour & Co. must pay a \$10,000 fine and \$8,000 costs.

The State Attorney-General, J. E. Taylor, who started a drive for antitrust enforcement two years ago, had charged that Armour entered into illegal agreements with three retailers in Missouri to fix the retail price of Dial soap.

Curb on Adjectives: Rhodes Pharmaceutical Co. is forbidden to call its "Imdrin" drug preparation "remarkable, amazing, sensational, or a new discovery of scientific research," the Federal Trade Commission says in a recent order. The cease-and-desist order also bans advertising that says the product will cure neuritis, sciatica, gout, neuralgia and other ailments.

Tiff Over Fractions: Alleging that oil refinery products were diverted by California Oil Co. through a "private arrangement," Texas City Refining Co.

has filed a \$2 million counterclaim for breach of contract against the former company in Superior Court in Baltimore. This was Texas City Refining's retort to a \$500,000 suit previously brought by California Oil. Texas City says it was contracted to receive the petroleum products, but that instead California sold the products to other companies controlled by E. M. Callis, ex-millionaire who was president of the California firm at the time.

Seepage Costs \$62,000: Chemical processing companies, already wary about possible liability for damages caused by pollution of air and streams, now are warned that polluting the soil also may result in costly law suits. The Texas Supreme Court has upheld the award of \$62,000 to Gerard Garrison, a rice farmer who sued on the claim that waste salt water from an oil field three miles away had seeped through the ground and practically destroyed his 1949 rice crop on about 300 acres.

No Tags on Trucks: In Buffalo, N.Y., Keeshin Motor Express Co. paid a \$500 fine in U.S. District Court after pleading guilty to a charge that the firm had failed to place proper warning signs or placards on trucks carrying explosives and other dangerous chemicals.

Company Fights Back: B-Vimm Co. of Meridian, Miss., is opposing a move by the Federal Trade Commission to get the firm to stop making certain allegedly "misleading" claims about its vitamin product, B-Vimm. The company has filed an answer denying the charges, and a hearing is to be held soon. FTC's complaint attacks these claims in B-Vimm advertising: that the product is effective for illnesses caused by vitamin or mineral deficiencies; that daily consumption will promote removal of poisons from the blood; and that it gives fast relief from muscular pain, indigestion, and other ailments.

FTC Wins One: In a Baltimore case also involving a vitamin-mineral preparation, FTC has obtained a consent decree that will bring a company's advertising into conformity with FTC standards. National Health Aids, Inc., of Baltimore, has agreed to stop advertising that its NHA Complex is useful in treating arthritis, rheumatism, malfunctioning of glands and other diseases; and that even well-balanced diets do not provide minimum daily requirements of vitamins and minerals.

Dewey Asks 'Safeguards': New York

Gov. Thomas E. Dewey is asking the state Board of Regents to "develop safeguards" to ensure proper relationships among physicians, drug store and drug wholesalers. Following an investigation into alleged unethical practices in handling of prescriptions and in financial connections between physicians and the pharmacy concerns, Attorney-General Nathaniel L. Goldstein has urged new laws to prevent "tie-ups and combinations."

KEY CHANGES . . .

Ralph F. Phillips: To development manager, Evans Research and Development Corp., New York City.

S. K. Bradley: To vice-president, Multiwell Bag sales, Union Bag and Paper Corp., New York City.

J. A. Bradnick: To director of public relations and advertising, West Virginia Pulp and Paper Co., New York City.

Ira S. Hurd: To director of sales promotion, Warwick Chemical Co. Div., Sun Chemical Corp., Long Island City, N.Y.

Archie H. Dean: To sales manager, Specialty Products Div., Reichhold Chemicals, Inc., New York City.

Donald G. Patterson: To technical assistant to Henry H. Reichhold, Reichhold Chemicals, Inc., New York City.

Addison S. Ellis: To director, Smith, Kline & French Laboratories, Philadelphia, Pa.

John M. Bandel: To vice president, Electro Metallurgical Co., Div. of Union Carbide and Carbon Corp., New York City.

Carl W. Schwenzfeier: To vice president in charge of engineering, Brush Beryllium, Inc., Cleveland, O.

Ralph C. Persons: To president, Sun Chemical Corp., Harrison, N.J.

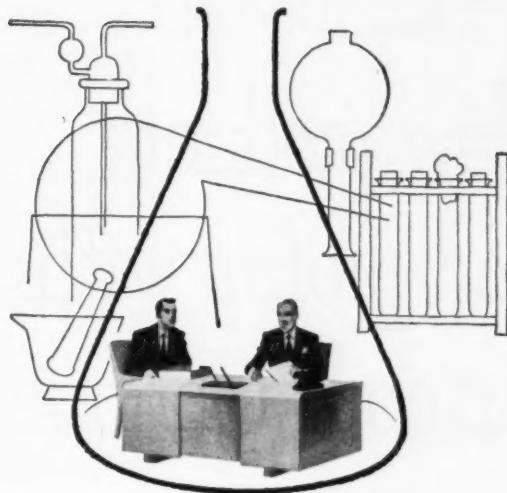
Richard R. Stanley: To executive vice president and director, Hydrocarbon Chemicals Inc., Newark, N.J.

John C. Virden: To director, Diamond Alkali Co., Cleveland, O.

S. F. Coneybear: To associate director of research and development, Colgate-Palmolive-Peet Co., Jersey City, N.J.

Harold H. Levine: To chief chemist, Humphrey-Wilkinson, Inc., North Haven, Conn.

Arthur N. Sudduth: To manager, abrasives division, Whittaker, Clark & Daniels, Inc., New York City.



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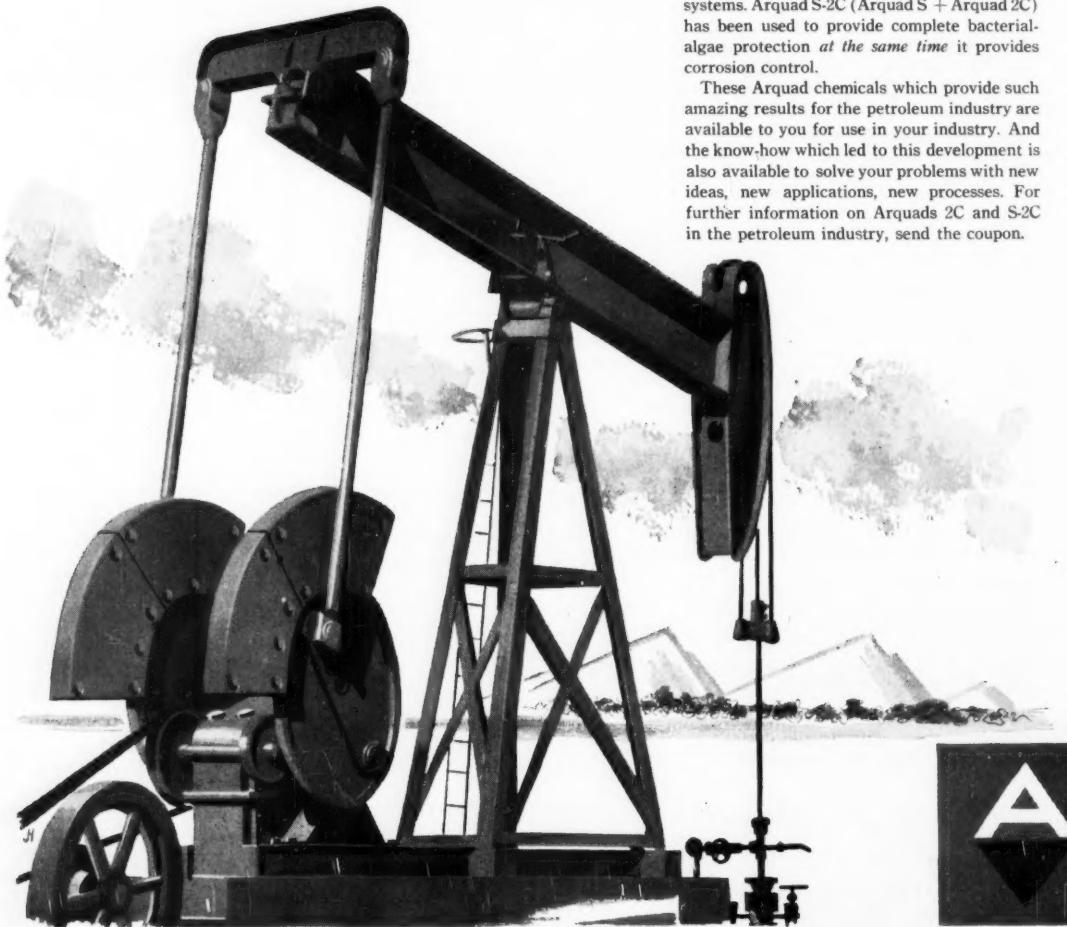
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RESEARCH

How Research Is Changing

The Hypertension Drug Picture

Nitrites

are still very popular. Sodium, ethyl and amyl nitrites; glyceryl trinitrate; erythrityl tetranitrate; and mannitol hexanitrate find use in therapy. Promising newcomers: ethylhexyl nitrate and hexanitroinositol.

Plant Extracts

notably of the veratrum viride plant are effective, widely used. Isolation and testing of pure veratrum alkaloids, the quest for more active extracts and a probe of non-veratrum alkaloids are keeping researchers busy.

Thiocyanates

though relatively toxic and in need of close therapeutic supervision, retain a sizable and long-established medical following.

Quaternaries

represented by pentamethylene and hexamethylene bis-dimethyl ammonium salts, are recent and unique innovations. Prolonging the effect of the quats with dextran and PVP has been promising. Using them in combination with the newly developed L-hydrazinophthalazine is another angle.

Adrenalin Blocking Agents

like 2-benzylimidazoline and chloroethylbenzylamine are excellent vasodilators, but of questionable therapeutic value. New compounds showing adrenalin-blocking activity are the sulfonic acid esters of β -dialkylaminoethanols.

Choline Derivatives

known as blood-pressure reducers for some years, are handicapped by untoward side reactions and brief therapeutic effect.

Antimetabolites

are the objects of brand-new, ground-breaking research. Researchers are seeking compounds to counteract hypertension-causing chemicals found in the body. Hopeful possibilities are found among indole derivatives.

Dialkylaminoalkanol Esters

provide a new lead. Half-esters of these alcohols proved effective in experiments with dogs. N-methylethyl esters of cis-tetrahydrophthalic and endo-methylene-cis-tetrahydrophthalic acids are most active, least toxic.

One out of every twenty Americans is the potential beneficiary of a concerted and ever-continuing chemical-clinical research campaign. The 5%—approximately 8 million sufferers of hypertensive disease or, simply, high blood pressure. The research effort—a sustained search for new and better pressure-reducing therapeutics.

Classification of a drug as a treatment for hypertension is not a clear-cut proposition. Any substance that can speed up or retard the heartbeat will inevitably have a marked effect on

blood pressure. But, in most cases, this cardiac stimulation or depression is a rather severe and transitory change, hardly suited for long-term treatment of hypertension. Dilatation of the blood vessels is, today, the therapy of choice.

And the development of effective vasodilators is an important item of business at a score of industrial, governmental and academic pharmaceutical research centers. Known medication, through the years, has run the gamut of physiologically active sub-

stances; vaccines, hormones, vitamins, sedatives, pyrogens, tissue and vegetable extracts, and several sympatholytic (adrenalin blocking) agents all have enjoyed varying periods of medical popularity.

But, in the final analysis, no one specific drug that gives satisfactory results in all cases has been found.

Vasodilators now in medical use may belong to one of several distinct chemical categories. Quickest and most dramatic in their action are the nitrites. Smooth muscle relaxers, the

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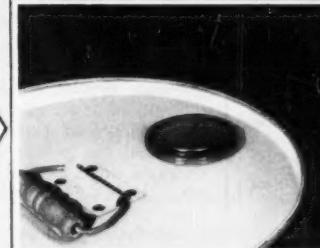
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RESEARCH

nitrites produce a particularly striking effect on the muscular blood vessel walls. As the muscles relax, the vessels dilate and pressure drops.

Activity is due to a still-undefined biochemical function of the nitrite ion. The therapeutic nitrites consist of inorganic salts (e.g. sodium nitrite), nitrous esters (like ethyl nitrite, amyl nitrite) and certain compounds that liberate nitrite ion within the body. Most important member of the last group is glyceryl trinitrate; runners-up are erythritol tetranitrate and mannitol hexanitrate.

Recent nitrite developments have been the favorable clinical results in tests of 2-ethyl-n-hexyl nitrate as a low-toxicity, prolonged vasodilator; and the discovery by Italian researchers of the pressure-reducing activity of hexanitro-meso-inositol.

Checkered Career: Thiocyanates have endured a checkered career in the treatment of high blood pressure. The sodium and potassium salts were introduced several decades ago, fell into disrepute because of toxicity. Yet, by no means, have they disappeared from the therapeutic scene; many specialists feel the thiocyanates have a real place in treating hypertension. Close supervision, however, is mandatory.

Alkaloidal veratrum viride extracts are probably the most effective agents now available for lowering the blood pressure. The drug, a mixture of alkaloids, is obtained from the roots of the *veratrum viride* plant. It acts on a nerve center in the brain, causes a slow-down of the heart rate and a corresponding drop in pressure.

As might be expected, the quest for potent drugs has led researchers to the isolation and evaluation of the individual alkaloid components of veratrum viride. In most cases the pure alkaloids possessed powerful hypotensive activity, but high cost and difficulty of preparation now preclude their commercial manufacture. Protoveratrine, the principal alkaloid of veratrum viride, looks especially promising. It has been tested clinically, found to be quite active yet not nearly as emetic as veratrum extracts. This last discovery assumes added significance in view of the fact that there isn't very much of a margin between the therapeutic dose of veratrum viride and that which causes nausea and vomiting.

Lack of immediate commercial prospects for pure alkaloids has not removed them from the research spotlight. Researchers of Squibb Institute for Medical Research, headed by O. Wintersteiner of penicillin fame, are

actively probing the hypotensive principles of veratrum viride.

Fractionation by counter-current distribution has made possible the isolation of the active alkaloids, germitrine and germidine. Germitrine, the more abundant and active of the two, accounts for the bulk of hypotensive activity in the root. Neogermitrine, a newly isolated triester alkaloid, rivals germitrine in activity. One added acetyl group differentiates the former from the latter.

As a practical compromise between ordinary veratrum viride extracts and the pure alkaloid components, pharmaceutical firms (e.g., Riker Laboratories, Inc.; Irwin, Neisler & Co.; E. R. Squibb & Sons; etc.) have settled on reasonably priced highly purified veratrum viride extracts.

Veratrum viride, however, is not the sole subject of plant extract studies. Other plants are now being screened for more potent, less toxic hypotensive components. Riker researchers, for instance, have isolated germitrine and a new hypotensive alkaloid, germanitine, in the plant *veratrum fimbriatum gray*. And Swiss chemists of Sandoz, Ltd. have pinpointed the potent alkaloids protoveratrine, verabiline and geraibine in the veratrum plant.

In addition, staffers of National Institutes of Health in cooperation with researchers of Eli Lilly & Co. and Riker Laboratories have isolated two new hypotensive ester alkaloids in the plant, *zygadenous venenosus*. They're veratroylzygadenine and vanillylzygadenine, resemble veratridine in their activity. This same plant source has also recently yielded neogermitrine, germidine and protoveratridine.

Enter the Quats: Quaternary ammonium compounds have given the synthetic organic chemists an opportunity to join in the hypertension fray. Pentamethylene and hexamethylene-bis-dimethyl ammonium salts, commonly called pentamethonium and hexamethonium salts, give a remarkable fall in blood pressure without undue side effects. Unfortunately, satisfactory results are not uniform; and the beneficial effect is of rather short duration.

An interesting attempt at prolonging the action of the quaternaries is found in recent experiments with the plasma extenders, dextran and polyvinylpyrrolidone. The idea, briefly, is this: Large polymer molecules of dextran and PVP, injected with the quat, retard absorption of the drug into the blood stream. Consequently, a depot of the drug is formed under the skin and therapeutic activity is retained for

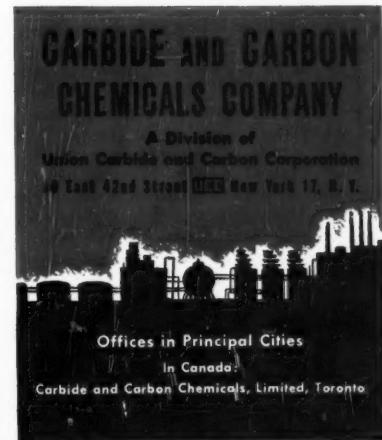
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RESEARCH

a period as long as seven hours.

A new pressure-reducing compound, developed by Ciba Pharmaceutical Products, Inc. scientists, promises to further bolster the fortunes of the methonium salts. It's L-hydrazinophthalazine, effective alone and as an adjunct to the methonium salts. The combination of hexamethonium and L-hydrazinophthalazine was recently reported to combine the best features of each drug. The rather brief roster of quaternaries is rounded out with Parke, Davis & Co.'s tetraethyl ammonium chloride.

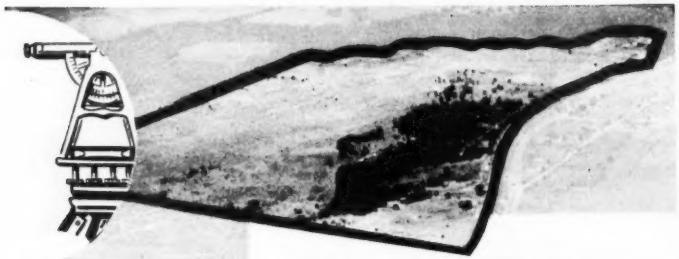
Adrenalin Blockers: Blocking the action of adrenalin, a long-standing approach to the hypertension problem, has given rise to several excellent vasodilators (e.g. 2-benzylimidazoline and chloroethyl dibenzylamine). But their general use in hypertension therapy has been questioned.

Choline derivatives also give rapid, effective vasodilation, but the effect is fleeting. Acetyl- β -methylcholine is stable enough for therapeutic use, but the frequency of side-reactions is a limiting factor.

Other experimental synthetics with hypotensive activity were recently discovered by Georgetown University investigators among half-esters of dialkylaminoalkanols. Most active, least toxic compounds occurred in the N-methyl-ethyl esters of cis-tetrahydrophthalic and endomethylene-cis-tetrahydrophthalic acids. Hypotensive activity of sulfonic acid esters of β -dialkylaminoethanols, similarly, has been reported at U.C.L.A.

Down to Fundamentals: The recent isolation and characterization of serotonin (CW, Sept. 20), a vasoconstrictor substance found in the blood serum, has opened the door to an attack on a possible fundamental cause of hypertension. If, according to the theory, high blood pressure arises from an excess of some hormone (or other metabolite), the condition should be amenable to treatment by antimetabolites (structurally similar substances) which counter the harmful effect.

Scientists of Rockefeller Institute for Medical Research synthesized a number of aminoindoles, found 2-methyl-3-ethyl-5-aminoindole slightly effective in dogs. A search for an orally effective antimetabolite led to 2-methyl-3-ethyl-5-nitroindole which did protect dogs against the vasoconstricting action of serotonin. The antimetabolite approach has not yet advanced to the clinical stage. Right now it's of major theoretical importance as a new and potentially rewarding pathway of research.



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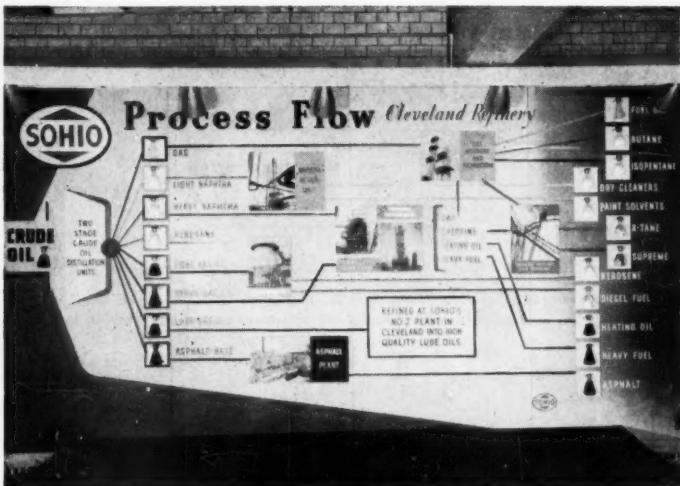
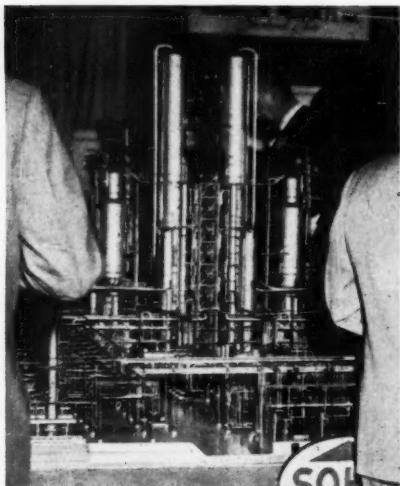
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PRODUCTION



SCALE MODEL UNIT AND REFINERY FLOW: The hit of the show.

Automation: Control by Product

There's a new word creeping into the language. It's "automation," and it's being used to convey the old concept embodied in the more familiar terms, "robot plant," and "push button factory." The basic idea has long since moved out of the realm of science fiction, has been the ultimate target of instrument specialists and design engineers for several years. But management is just now becoming fully aware of it, as witnessed by meetings earlier this month of the American Management Association (in Cleveland*) and the American Society of Mechanical Engineers (in New York).

Both groups devoted a large portion of their programs to talks and panel discussions of automation. For the most part they concerned themselves with the sociological and labor implications of the subject. They're important for the long-range view. But chemical executives, particularly those charged with production responsibilities, right now are more concerned with questions like, What's the status today? What's needed for full automation? How far away is it? and, How much will it cost to convert from present plants to fully automatic ones? To get these answers, CW last week interviewed some of the leading figures in the field.

* Where the hit of the show was Sohio's \$8,500 crude oil distillation unit placed in operation this fall. Part of the Cleveland refinery, it is not fully automatic, requires five operators. It is, however, typical of the progress made toward automation in the petroleum field.

Semantic Squabble: One of the difficulties encountered in discussions of automation is that the word takes on different meanings for different people. Thus the engineer designing a steel plant wistfully looks on a petroleum refinery as the ultimate in automation. It isn't though; for when the chemical engineer thinks of automation he thinks of completely self-regulating production.

Take the case of a typical, highly mechanized plant in the process industry. It's operated completely from a central control panel. But samples of the product are sent to the lab for analysis. If there has been a change in feed stock or other variable, the information is relayed to the plant where an operator makes the necessary adjustment on the control panel to get the desired product. The trouble is that there's a time lag between the time the variable has changed and the time the adjustment is made.

In a fully automatic plant, there is no need for an operator to make an adjustment on the panel; it's all done automatically. An instrument continuously analyzes the plant stream, sends the data to a computer which then corrects to give the desired product. That's end-product quality control and it's the key to full automation.

What is needed before full automation becomes a reality in large segments of the chemical industry? Basically, more information—both on products and processes. Big strides have

been made in getting product data automatically and continuously with infrared, mass and X-ray spectrometers, titrimeters and viscometers. But there must be instruments for measuring all end-product criteria.

It's also necessary to have a more complete knowledge of how the process variables affect the product. And the engineers must work up equations to correlate the end-product data with the process variables; for in spite of a lot of loose talk about electronic computers replacing human judgment, they are simply machines that can carry out instructions rapidly and efficiently. The human-devised equations are their instructions.

In many cases, these equations have already been figured out or can be established without too much difficulty. In others, they will pose a real problem for plant designers.

In any case a fully automatic plant, will probably look very much like present plants. The big difference is that there will be a computer next to the instrument panel, and no operator.

Ignorance Frontier: There is a variety of opinion among experts as to just when full automation will arrive—if at all—and how much it will cost. However, it's safe to say that there will never be full automation in all plants, and the ones that are most advanced today are the most likely to get there first. That would mean chemical plants and oil refineries.

But there, too, the range of opinion



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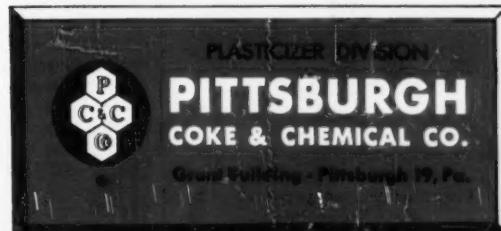


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Let's Define the Terms

ACCORDING TO PLATO, the only way to argue for people who can't agree on terms, is with sticks and stones. To a certain extent many of those who are currently talking about "push-button" factories and automation are doing just that. The following have been compiled from several sources. They are not meant as rigorous definitions but as a framework for understanding some of the commonly used—and misused—terms.

• What is automation?

There are many meanings for this. In the strictest sense it means completely self-regulating production. In a looser sense, it means mechanized handling of materials. There are several degrees of meaning between the two extremes.

• What is an open-loop control system?

It's one that simply measures a result, does nothing about com-

pensating for it. An example is a thermometer that merely tells you how hot or how cold a given room is.

• What is a closed-loop control system?

It's one that measures the error between the state that exists and the desired state, then corrects the error. An example is a thermostat that controls a furnace to maintain a constant temperature.

• What do you mean by feed-back?

That's the signal from the process to the controller showing instantaneous value of the variable. The controller then measures the error and corrects for it.

• What is a servomechanism?

Experts can't agree on a definition for this at all. Essentially it's a type of automatic controller that maintains a position in a desired relation to an input quantity.

is wide: Some say fully automatic, never; some say at most five years; others, at least ten years. One of the leading proponents of automation, an executive for an oil company, puts it this way: "We won't have fully automatic plants until the army releases transistors to industry. The amplifier tubes that could be used now in place of transistors won't do because their life is too short." He sees full automation in about five years, estimates that it will add 20% to the cost of the plant.

On the other hand, Donald P. Campbell, an associate professor of engineering at M.I.T. currently working on the problem, thinks full automation is at least ten years away. Says he: "It will take five or six years just to work out the necessary equations even with the aid of computers, for we are working on an ignorance frontier." Campbell figures that 5%-7% of present plant costs go for conventional instruments. To get a "highly automated" plant, you'd have to double that figure. And that would give about 98%-99% automation.

But Campbell points out that there is a point of diminishing returns in the race toward full automation. In short, the cost of eliminating the last man could be so high as to make it impractical. Conceivably, says he, full automation might triple the cost of building a plant. As an example he gives a conventional valve controller.

It might cost \$500 while the type needed for the last step in automation might cost \$15,000.

In the Balance: Whatever the increase in cost for an automatic plant, it has to be balanced against the savings that would accrue. For example, it would eliminate the need for a lot of costly blending equipment since the plant would turn out consistently a product to exact specifications. Then too, an automatic plant would be able to operate at capacity. Labor savings would not be an important consideration to chemical companies, but the increased safety would.

Automatic plants would mean problems in management, training and education. It would call for a total realignment of thinking on design. And labor unions, most of which have fought mechanization tooth and nail, will continue to fight any further trend in that direction.

On that score, though, the consensus is that automation will not cause unemployment. It would bring on some severe readjustments if it occurred overnight. But the change won't be a sudden revolution, it will be a gradual evolution.

EQUIPMENT

Numerical Printing: A printing mechanism has been coupled with various Streeter-Amet (Chicago) recorders. Now, analog quantities that can be converted to corresponding voltages

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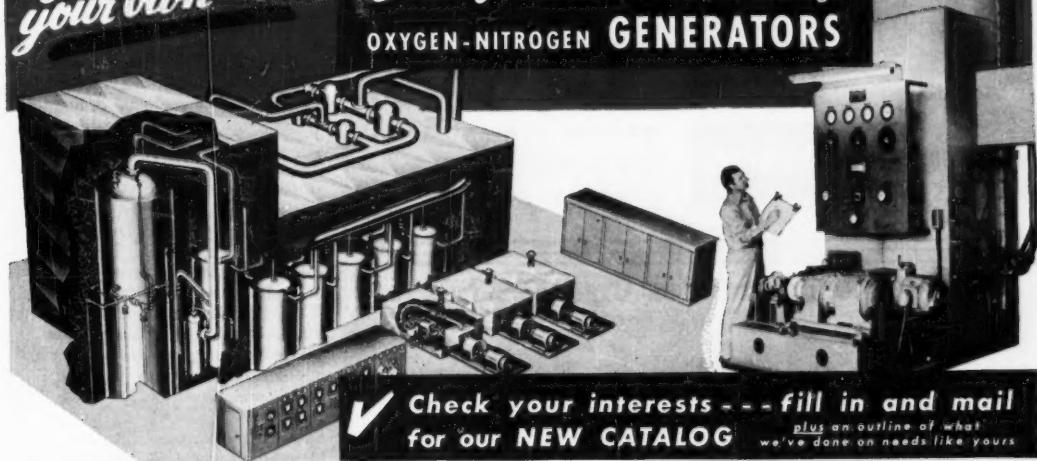
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PRODUCTION

may have their numerical values printed.

Name Change: Having outstripped its name along with its charter, National Fireproofing Corp. (Pittsburgh) changed one and broadened the other: It's now called Natco Corp.

Flow Weighing: Control Engineering Corp. (Norwood, Mass.) claims its new flowmeter will weigh anything that flows regardless of the substance's characteristics. Not yet available for industry, the instrument measures the mass of a liquid as it flows through a rotating pipe. And by applying algebraic equations, the flowmeter converts the measured output into the fluid's weight.

Infrared Analyzer: Now available from Leeds & Northrup Co. (Philadelphia) is an instrument for the continuous measurement of one gas compound in a plant stream mixture. Applications: measurement of methane in ammonia manufacture, sulfur dioxide in paper-making, isobutane in alkylation units, and carbon monoxide in the regenerator of fluid catalytic cracking units.

Silicone Insulation: Dow Corning Corp. (Midland, Mich.) has just published a booklet containing data sheets and condensed reports on Silicone (Class H) electrical insulation. Greater longevity (10 to 100 times) and increased power per pound ratio (50%) are claimed for motors with this Class H Silicone insulation.

Sawing Bricks: According to Clipper Manufacturing Co. (Kansas City, Mo.), cutting bricks to the special shapes required in furnaces, kilns, and boilers can be speeded with a masonry saw marketed by the company.

For Dry Throats: Abbeon Supply Co. (Jamaica, N.Y.) has added an aluminum plug-in table model to its line of humidifiers. The vaporizer adds approximately a pint of moisture per hour to room atmosphere by centrifugal force.

Small But Sturdy: With capacities from 500 to 5,000 pounds, portable cranes brought out by Barrett-Cravens Co. (Chicago) can reach over barriers to pick up their loads. Special features and attachments are available for different type loads and operating environments.

Improved: All-State Welding Alloys Co., Inc. (White Plains, N.Y.), claims its improved phosphor bronze electrode makes a stronger joint, and

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MONOCHLOROBENZENE

Synonym: Phenyl Chloride
Formula: C_6H_5Cl
Molecular Weight: 112.5
Appearance: Clear, colorless liquid



TYPICAL PROPERTIES

Freezing Point $-44^\circ C$
Distillation Range 131.2° to $132.2^\circ C$
Specific Gravity, $15.5^\circ/15.5^\circ C$ 1.114

USES

INSECTICIDAL INTERMEDIATE: DDT and other insecticides.
DYESTUFF INTERMEDIATE: Sulfur black and brown dyes.
CHEMICAL INTERMEDIATE: Organic synthesis.
SOLVENT: Paints, varnishes, lacquers, paint removers; general use.
HEAT TRANSFER FLUID: Suggested for condensing vapor systems, such as glass-enamelled vessel jackets, which cannot stand high steam pressures.

MONOCHLOROTOLUENE

Synonym: Methylchlorobenzene
Formula: $CH_3C_6H_4Cl$
Molecular Weight: 126.5
Appearance: Clear, colorless to straw-colored liquid.



TYPICAL PROPERTIES

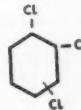
Freezing Point below $-45^\circ C$
Distillation Range 158.3° to $161.7^\circ C$
Specific Gravity, $15.5^\circ/15.5^\circ C$ 1.080

USES

SOLVENT: Rubber and synthetic resins.
INTERMEDIATE: Manufacture of rubber accelerators, chemicals,

TRICHLOROBENZENE, Tech.

Formula: $C_6H_3Cl_3$
Molecular Weight: 181.5
Appearance: Clear, almost colorless liquid



TYPICAL PROPERTIES

Freezing Point $10^\circ C$
Distillation Range 5° incl. $216^\circ C$
Specific Gravity, $15.5^\circ/15.5^\circ C$ 1.466

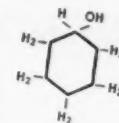
USES

INSECTICIDE: Soil poison for termites.
SOLVENT: Fats, oils, waxes, resins; crystallization solvent.
HEAT TRANSFER MEDIUM: Condensing vapor systems, 210° to $300^\circ C$.
DIELECTRIC FLUID: Transformers.
INTERMEDIATE: Dye intermediates, other organic chemicals.

HOOKER SOLVENTS

CYCLOHEXANOL

Synonym: Hexahydrophenol
Formula: $C_6H_{12}OH$
Molecular Weight: 100.1
Appearance: Viscous, colorless liquid
with pleasant, aromatic odor.



TYPICAL PROPERTIES

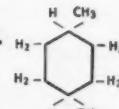
Freezing Range	..... 18° to $22^\circ C$	High Grade	..... $-10^\circ C$ to $-20^\circ C$
Boiling Point	..... $161.7^\circ C$	Tech. Grade	..... $161.7^\circ C$
Specific Gravity	..... 0.945	..... 0.939	..... 0.939
Flash Point	..... $67^\circ C$	..... $61^\circ C$	..... $61^\circ C$

USES

SOLVENT: For resins, metallic soaps, dyes, fats and oils, dry cleaning agents.
BLENDING AND STABILIZING AGENT: In textile soaps and homogenizing agents.
ALSO USED: In lacquers, varnishes and paints, floor waxes, degreasing of leather, shoe creams, also a plasticizer and ingredient of lubricating oils, as a chemical intermediate in organic synthesis.

METHYL CYCLOHEXANOL

Synonym: Hexahydroresol
Formula: $CH_3C_6H_{10}OH$
Molecular Weight: 114.1
Appearance: Light straw-colored, neutral, viscous liquid.



TYPICAL PROPERTIES

Distillation Range	..... 155° to $180^\circ C$
Specific Gravity, $15.5^\circ/15.5^\circ C$	..... 0.924
Flash and Fire Points	..... $71^\circ C$

USES

SOLVENT: For cellulose acetate, nitrocellulose and other cellulose esters for lacquers and coating compositions.
ANTI-OXIDANT: In lubricants.
BLENDING AGENT: For special textile soaps and detergents.

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Electronic Spectrophotometer: Developed in a Navy research project, a new spectrophotometer uses a servo-mechanism to balance solute and solvent light beams. A just-released report from the Office of Technical Services points up the instrument's speed, sensitivity, and stability.

"Hydro-Jupiter": Now available from Gustav Spangenberg Machine Factory (Mannheim, Germany) is a recently developed planetary mixing and kneading machine. Suggested applications: in the paint, varnish, enamel, leather, food, textile, chemical, cosmetic, and plastic industries.

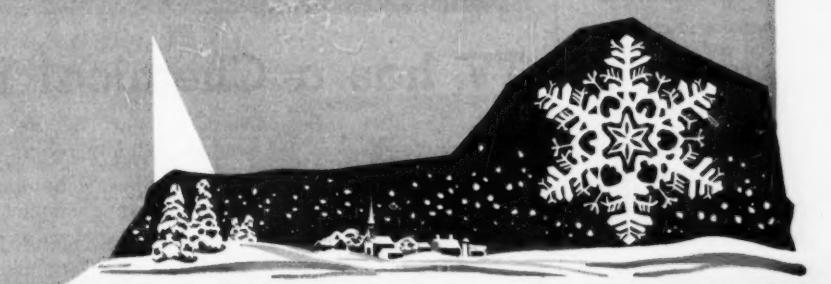
Plastic Pipe: More plastic pipe will soon be available from Michigan Plastic Pipe Co. (Detroit) with its Melvindale plant now on stream.

All in the Vibrations: Atomic Energy Commission has just released 26 more patents for non-exclusive, royalty-free licensing. One of the more fascinating of the current batch is U.S. 2,614,645, for an "apparatus for chemical reaction detection," issued Oct. 21, 1952, to H. A. Wilhelm. According to AEC, "This patent describes means useful in following the progress of a chemical reaction within a sealed reaction chamber. This is accomplished by a novel combination of devices for the detection of the sonic vibrations set up within the sealed reaction chamber . . ."

Humidity Cabinet: Blue Electric Co. (Chicago) is introducing a new constant temperature humidity cabinet, that's claimed to provide greater temperature uniformity. Automatic controls are said to insure response sensitivity to plus or minus one-half degree (C.). It's available in standard voltage, made of stainless steel.

Viscometer at a Distance: The Ultra-Viscoson Corp. (Hartford, Conn.) is introducing its Model MP Multi-Probe Ultra-Viscoson systems. The systems take automatic viscosity measurements on fluids at temperatures up to 650 C. and pressures up to 1,000 psi at as many as 16 different stations. It's said to be able to monitor all 16 stations (kettles, reactors or pipelines) automatically as far as 1 mi. from the probes.

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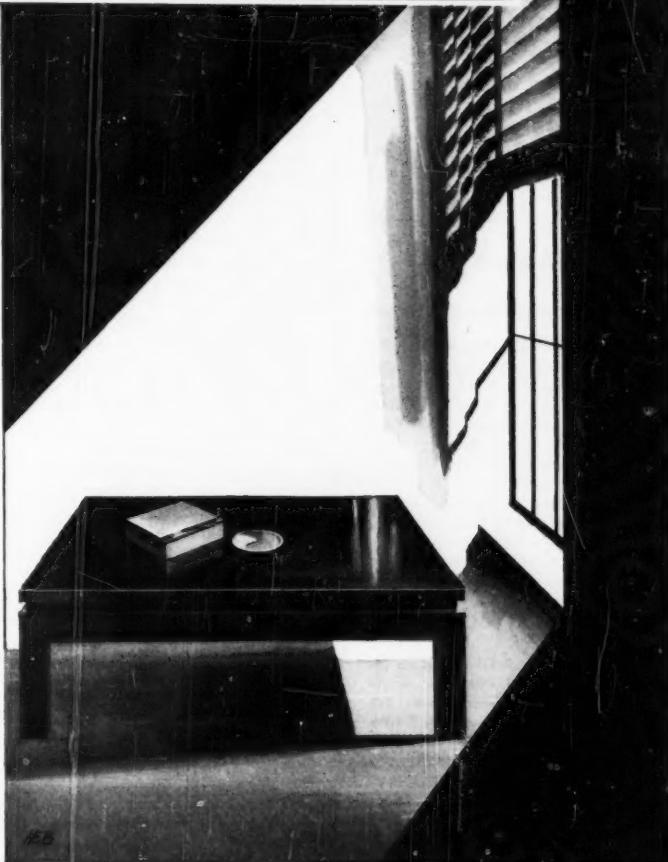
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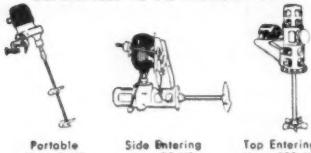
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SPECIALTIES

RCA) produce their own phosphors, have enough left over to sell to others. Most manufacturers, however, including independents (the ones that don't make complete sets) like National Video Corp., buy from outside sources. U. S. Radium and the Photo Products Department of Du Pont are typical of such suppliers.

Reason for the high price and the limited number of suppliers is the detail in producing the extra-pure sulfides. Though the process for zinc sulfide might be outlined as formation of the sulfide with hydrogen sulfide from a solution of the oxide in sulfuric acid, it is far more complex than that description indicates.

Precautions for purity, and the care needed in making the 1-30 micron crystals (most average 10 microns in diameter) keep out many potential makers. In addition, the final firing process for the phosphors is delicate; temperatures must be kept within a few degrees of the determined-by-trial processing heat (which patents list in the 900-1,000 C range).

Only the Start: Difficulties in phosphor manufacture are only the beginning problems for the cathode ray tube makers—problems that seem to plague them until the tube is installed in the receiver. Chemicals play a major part every step of the way.

The glass tube must be cleaned, generally with hydrofluoric acid or ammonium bifluoride, to give a surface on which the phosphors can adhere. Then the tube is placed—viewing-side down—on a special rack or belt, and a cushioning solution of barium acetate, about three inches deep, is poured into the tube.

A suspension of phosphors, in distilled or de-ionized water* is eased in. This includes the zinc sulfide, which phosphoresces blue, and the zinc cadmium sulfide, which produces a yellow color. Both salts are "activated" by 0.01% silver, ordinarily in the form of silver nitrate. The silver is introduced during the phosphor preparation.

Potassium silicate, carefully purified, is added with the suspension of sulfides. It appears to bind the crystals to the tube face, preventing the crystals from sliding—called "snowballing"—to the center of the curved surface.

Slow Settle: Settling the 4-6 mg./sq. cm. of this P4 coating† is a tricky operation. The conical portion of the

tube shank and the curved face make it necessary to cool the suspension carefully a few degrees below room temperature in order to set up the thermal currents which aid in creating an even coating. It takes about 15-40 minutes for the major portion of the phosphors to come down, after which the supernatant liquid is cautiously poured (in some large tubes, siphoned) off.

A bake at approximately 400 C completes the screen, unless, as is becoming more frequent, the tube is "aluminized." This process, designed to brighten the viewed picture, consists of laying down a smooth coat of nitrocellulose on the screen, and depositing a mirror-like layer of aluminum on it. General Electric and Philco are among the leaders in aluminized-tube production.

Color Complexities: Advent of color television will multiply the problems of screen making. The CBS could probably make use of a tube which has been coated in much the same as the above manner, with a red phosphor—such as zinc-activated zinc phosphate—added.

But the color tube now under principal development is the RCA type. This has a screen consisting of minute dots (675,000 in a 17-inch tube, for example) of different phosphors for red, blue and green. These dots are usually arranged so that their centers would form the apices of an equilateral triangle. They use a slightly lesser amount of phosphors than do even-coated white TV screens.

Silver-activated zinc sulfide might be the blue, copper-activated zinc sulfide the green, and zinc-activated zinc phosphate the red. But other color combinations and other phosphors may be employed.*

Red is a problem now—the zinc phosphate is neither quite red nor quite bright enough.

But the major difficulty introduced by color tubes will be the mechanics of putting down the triple dots. Silk screening, lithographing and a variety of processes are under tests. Whatever will be chosen, it will likely result in a tube far more expensive than present black-and-white TV tubes.

Conductor Coat: In addition to the screen chemicals, most TV tubes require "getter" metals to increase the vacuum, as well as metals for the anode and electron gun. In addition, most tubes receive a coating of graphite. This is usually painted by hand on the tube walls to lead off stray

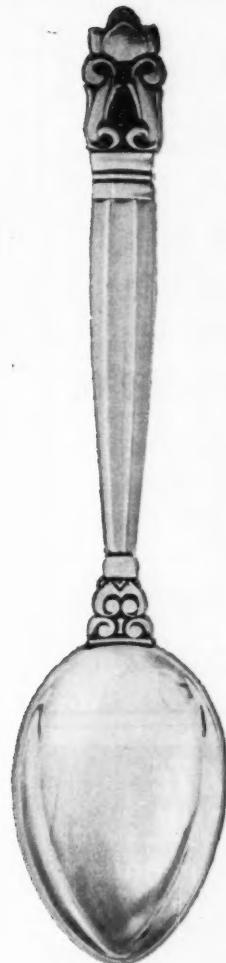
* As little as one part of copper in 20 million can seriously alter the color of the light which the phosphor emits.

† Radio tube makers have coded the phosphor screen blends as P1, P4, or P6 (a color screen), etc. There are several P4 phosphor combinations, and they are altered slightly from time to time.

* Possibly blue phosphors: zinc silicate, or calcium magnesium silicates, both titanium-activated. Green: manganese-activated zinc silicate. Red: cadmium borate or zinc beryllium silicate, both manganese-activated.

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SPECIALTIES

electronics. An asset of all-glass tubes: By coating the outside of the cone with graphite, a condenser is thus made that simplifies and lowers the cost of the set.

Although there have been major difficulties in developing the phosphor screens, their cost is not a major factor now. Thanks to the increasing demand for the phosphors—and the refined

production techniques—prices have descended from the near-\$100-per-pound price in the early '40s to a third of that in 1947—and on down to the current price of about \$15.

Taken altogether, the chemist has had a lot to do with bringing television to the masses. And with color TV in the offing, his key role is not likely to diminish.

Expert in Emulsions

Specialties makers at the recent CSMA conclave had a real opportunity: a chance to meet modest Helen Wassell, whose formulations for floor waxes and polishes have put more than one of them in business.

Working at the Mellon Institute in Pittsburgh, Miss Wassell has developed some of the most widely used rub-less floor-wax formulations and shampoo recipes in the field. Major portion of her work has appeared in *Emulsions*, Carbide and Carbon Chemical Corp.'s widely known book describing products which utilize its chemicals, a book she's anonymously authored since the early '30s.

And she's still doing vital research. Her paper for the CSMA on amine retention in floor waxes demonstrates her current work—and the packed hall where she spoke shows how important her research is regarded.

Clean and Polish: Pittsburgh-born Miss Wassell joined up with the Mellon Institute shortly after getting her B.S. degree from Carnegie Tech at the close of World War I. She spent more than ten years working on problems of dry cleaning before she switched over to emulsions.



HELEN WASSELL: A fortune in formulations.

Perhaps her best known formulations are those for no-rub floor waxes. With an aim toward expanding applications of Carbide's triethanolamine and morpholine, Miss Wassell created the recipe that was the basis of nearly 90% of the rubless polishes produced in the pre-1940 period. The recognition of chemistry's importance by polish makers—resulting in the establishment of their own development labs—has lowered the commercial importance of her old formulations, as has the introduction of shellac "waxes" and various carnauba substitutes.

But Carbide customers still count on her to smooth out the wrinkles in their formulations and thereby profit from her continuing developmental work.

As for cosmetic preparations—cold creams, cleansing creams, hand protector creams, shaving creams—Miss Wassell has helped to develop them all. One of her hair shampoos has been the basis of one of the nation's largest selling products.

A number of Miss Wassell's formulations have been patented—and assigned to Carbide. The idea isn't to restrict the number of makers; rather, it's to ensure that no single firm clamps down on the recipes and thus limits the potential customers.

Moment of Doubt: Despite the success of much of Miss Wassell's work, she's had her disappointments. A little discouraged by her future in chemistry, she once decided to get out of the business altogether, took a secretarial course in preparation for the switch. But she was dissuaded in time, and admits it's a good thing that she was.

Success of her developments notwithstanding, she's happy to stay in the laboratory end of the work. She has a great deal of respect for the salesmen who put her formulations across, but she has resisted the temptation to go into the manufacturing of her own products.

It seems to have worked out pretty satisfactory all the way around for both Miss Wassell and her beneficiaries.

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1929

1931

1932

1935

1937

1938

1941

1944

1946

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1952

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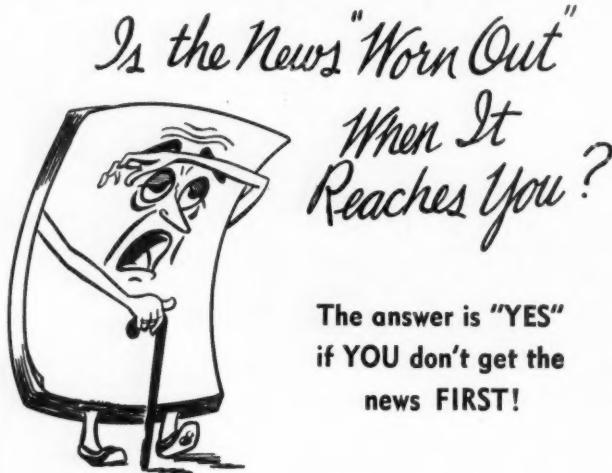
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SPECIALTIES

Receding Opinion

The tide of generally favorable comment about chlorophyll and its derivatives now appears definitely to be receding. In a recent ACS meeting in New York, Alsoph Corwin thoroughly discounted it as a wound healer or deodorant, and at a gathering of the American Dental Assn., it was lambasted again. This time both chlorophyll and ammoniated dentifrices were declared to be of doubtful value.

Award to McDonough: Everett G. McDonough, best known for his development of the mercaptan-based "cold" wave treatments, received the Society of Cosmetic Chemists' medal at the Society's meeting last week.

Fair Trade: Deemed almost certain to uphold the Lilly plea for an injunction restraining Schwegmann Bros. from selling Lilly drugs below fair trade prices, Federal District Judge J. Skelly Wright, was still weighing the arguments at latest report.

Schwegmann declared on the stand that his firm had no "loss leader" items, and that he can make a profit because the drug markup is so high—"you would not believe one man would charge another such a price." The Lilly contention is that the point at issue is the non-signer clause of the McGuire act, which is in line with Judge Wright's remark that the defendant would have to find his comfort in the Supreme Court.

False Alarm: The "alarm clock" tablet CW inadvertently attributed to Smith, Kline & French Laboratories is actually the product of the Central Pharmacal Co., (Seymour, Ind.), and has been tabbed Somnadeox.

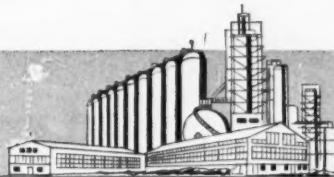
RFC Loan: Granted recently to the Dixie Paint & Varnish Co., Inc. (New Brunswick, Ga.) was a \$150,000 loan by the RFC.

Albany Addition: Adding 17,000 sq. ft. to its plant facilities at Albany, Cal. is Adhesives Products, Inc. The expansion will cost an estimated \$80,000.

Dolcin Decision: The Federal Trade Commission upheld a recent hearing examiner's decision that the medicine Dolcin is not an effective treatment for arthritic or rheumatic conditions. But Dolcin's maker declares the Commission ignored favorable evidence for its product, and will file an appeal with the Commission, and with U.S. Circuit Court of Appeals.

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- Uniform operating conditions
- Consistent economic yields
- Maintenance of catalyst activity
- Simple heat recovery
- Safety of operation

General information on pilot plant operation, preliminary estimates of plant investment and operating costs is available. Vulcan's staff is also equipped to carry out detailed engineering and economic studies as a first step toward design, supply and construction of fluid-bed ethylene oxide plants.

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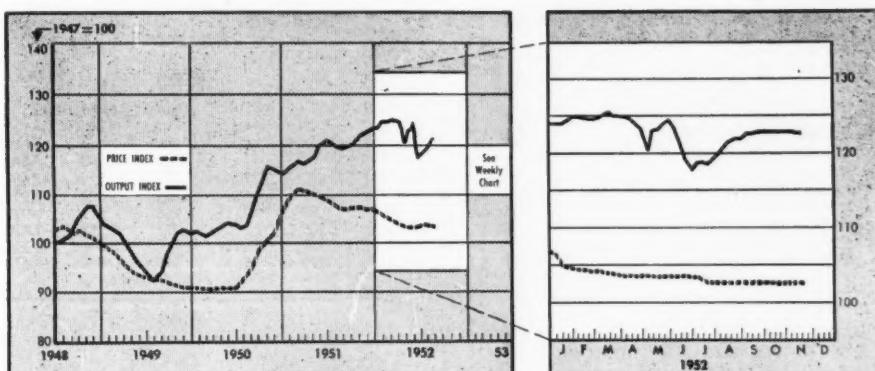
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MARKETS



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
 CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

The New Year holds an optimistic promise for most chemical-process-industry markets. Some slackening in defense buying is predicted, but on an overall basis, chemical and allied business activities should continue at a brisk tempo.

One factor for the happy outlook may be the almost-certain end of price controls—expected early in 1953—and the resultant return to a “free market.” Prices of some commodities may then be upped, but most observers see no threat of a serious price inflation. Supply-and-demand will be allowed to fulfill its historic role.

But despite the unpopularity of the Washington tethers, a few far-seeing CPI spokesmen believe that the final word on decontrol will come—not from the new Eisenhower administration—but from the Kremlin. Now, as in the past, war would completely change the picture.

The industrial alcohol market is still in a state of flux. Shell Chemical's recent boosting of ethyl and isopropyl alcohol prices (and subsequent reduction of 99% isopropyl to 43¢/gallon in tanks) had other major producers playing an “After you, my dear Alphonse” game—each waiting to see whether or not the others would follow Shell's lead.

By this week, however, some alcohol makers have taken the plunge—they've notified their contract customers of higher prices effective the first of the year (CW, Market Letter, Dec. 20).

Some widely divergent t.c. schedules being quoted to contract buyers in Eastern territories: Pure ethyl alcohol, tax free, 40¢/gallon by one producer, 55¢/gallon by another. West Coast prices remain 10¢ higher.

Increasing supply, decreasing demand pressured synthetic phenol USP crystal prices downward late last week. Major producers knocked off 1 1/4¢/pound bringing the t.c. tag to 18¢; carlot and less than carlot to 19 3/4¢, 20 1/2¢/pound, respectively, delivered in the East.

Natural phenol prices were also shaved slightly. At the moment, the 90% technical material is down 1/4¢ to 17¢/pound; 82% material is going for 16 1/2¢, a 3/4¢ reduction from previous schedules.

Competition is no small factor in recently lowered coaltar cresylic

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	125.3	125.0	125.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	102.5	102.4	106.5
Bituminous Coal Production (daily average, 1,000 tons)	1,658.0	1,673.0	1,919.0
Steel Ingots Production (1,000 tons)	2,140.0	2,362.0 (rev.)	
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	260.1	259.6	244.4

MONTHLY INDICATORS—TRADE (Million Dollars)

	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	\$24,632	\$23,663	\$22,726	\$43,310	\$43,224	\$42,437
Chemicals and allied products	1,669	1,602	1,520	3,006	3,022	2,993
Paper and allied products	729	699	717	956	973	930
Petroleum and coal products	2,185	2,109	2,101	2,777	2,788	2,630
Textile products	1,180	1,137	1,151	2,818	2,833	3,336
Leather and products	269	275	251	545	541	677

acid prices. The reductions announced by producers range from 5 to 15¢/gallon, depending on grade.

Foreign cresylic and some domestic petroleum materials are still lower than the coaltar schedules—but the gap is narrowing.

Meta-para cresol users are also getting a break price-wise. Some close-boiling grades are now selling at about 13¢/pound, wider-boiling cresols at approximately 12¢. Most producers are going along with last week's 2 1/2¢/pound cut from previous prices.

Demand for the cresols has been far from strong, but suppliers report that ortho has been moving a bit better than the mixed meta-para isomers. Chances are, early '53 should see a pick-up in these tar acids, however. Reason: Consumers' year-end inventories are not too high.

Ammonium sulfate supply remains somewhat tight. By this week it's clear that even the recent price advances have had little effect in curbing demand. At the moment coke-oven prices range from \$44 to \$49.50/ton in bulk, depending on which section of the country you're in.

Western, southwestern synthetic sulfate users are shelling out between \$47 and \$49.50/ton, bulk f.o.b., with sellers striving to keep all their customers happy.

There may be some relief for Eastern ammonium sulfate consumers when U. S. Steel's Morrisville, Pa., chemical byproducts plant gets rolling. But chances are that won't be before late next month.

Persistent buyers' market prevails in insecticides. Producers are eagerly competing to supply the few far-sighted formulators and dealers who are taking advantage of the slack season.

Aldrin and dieldrin buyers were handed a big inducement last week when prices were slashed 28 1/2¢/pound for the former, 60¢/pound for technical grade dieldrin. New tags: 64 1/2¢, \$2.00/pound respectively.

DDT prices are hovering around a quarter a pound, and BHC available for spot sales is at a low \$1, or less, per gamma unit. They highlight the keen competition. But chances are the current soft market will tighten—some say within the next several weeks.

Producers, with their fingers crossed, are urging: If you formulate, distribute or use insecticides, order now while prices are low.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 22, 1952

DOWN—

	Change	New Price		Change	New Price
Cresylic Acid, dom., coal tar, 207° or above, c.l., gal.	\$.15	\$1.01	Cresol, tech., 50% below 204°, c.l., frt. equald.	\$.025	\$.133
Aldrin, 60%, c.l.	.285	.645			

All prices per pound unless quantity is stated.



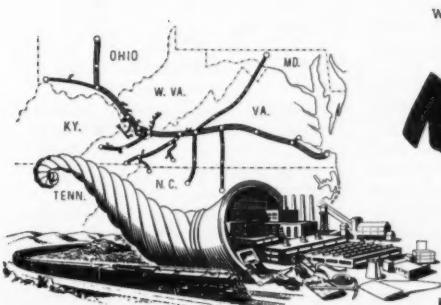
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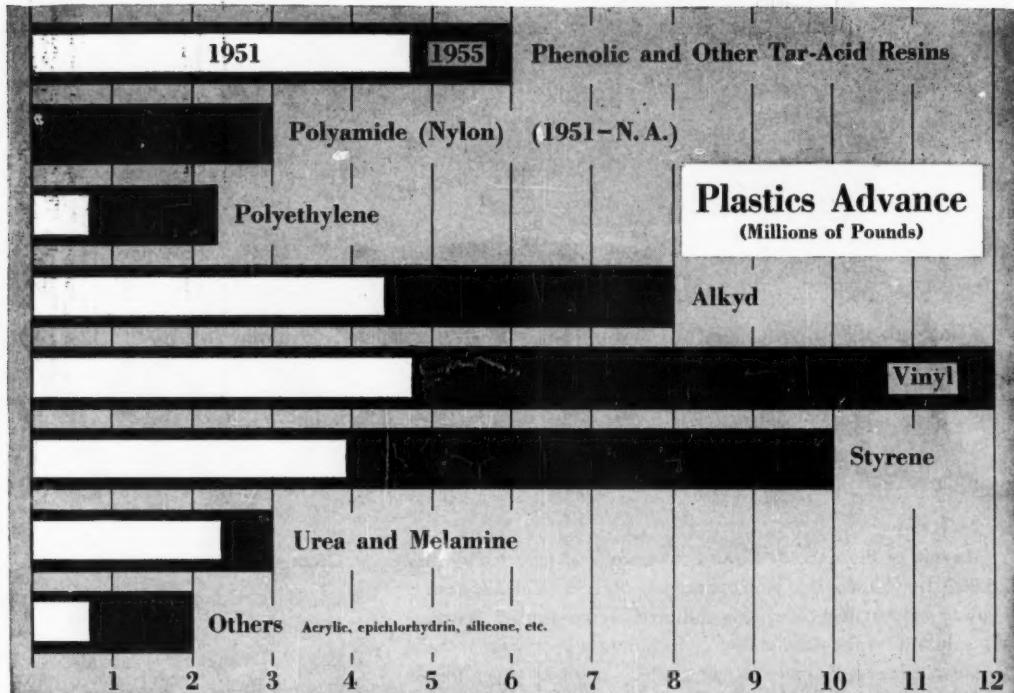
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Plastics—New, Better, and Bigger

Last fortnight's record-attendance meeting of the Chemical Market Research Association jampacked the Palmer House in Chicago. The purpose of those attending: to see—through the eyes of leaders in the industry—what the future holds for plastics, whether the present swift pace will be maintained.

And if any member approached the gathering with doubts concerning the trend, his fears should have been dispelled during the following hours. Emphasis was unreservedly upon the new, the better, the bigger.

New Phenolics: Gordon Brown, Bakelite's vice president, led off the meeting with new developments in phenolics:

- A high-speed molding material, which reacts much too fast for today's equipment, designed to cut molding costs in tomorrow's economy.
- Expanded use of paper-and-cloth laminates impregnated with phenolic resin—the table and counter-top type.
- Stepped-up consumption of low-cost impregnated waste wood for building board, as substitute for higher-priced lumber.
- New foam-type packing material.

Processed at room temperature, it promises unusual adaptability to packing problems.

- Growing trend toward larger molds—of the shell type—for one-piece cabinets and foundry applications.

- A new molded rubber-phenolic combination, tough and highly impact-resistant.

Vinyls Also: Similar developments are taking place in other plastics. J. C. Richards, vice president, B. F. Goodrich Chemical, introduced two packaging items fabricated of vinyl resin: (1) a thin extruded film for coating and (2) a blown sponge for packing. Both these products, Richards declared, are creating substantial outlets for vinyl although just newly introduced.

The good and bad of vinyl films was also discussed by Richards. Made strictly to proper specifications, they offer endless applications. Cheapered by such practices as thinning to stretch material supply, they can and have earned a poor reputation in such products as shower curtains. Remedy, pointed out by Richards: a code of standards, conscientiously observed.

Other fields contributing to the

boom in vinyls: flooring, wall coverings, non-woven fabric binder.

Structural: Polyester resins reinforced with glass fibers will enjoy greatly expanded markets, predicted Morris Bigelow, Plaskon's technical director. Of the many fields where Bigelow expects the reinforced polyesters to supplement or supplant metals and wood, some of the most imminent are:

- Automobile bodies. Trial models are already being tested in Detroit.
- Boats requiring neither caulking nor painting (nor—for that matter—for the winter).

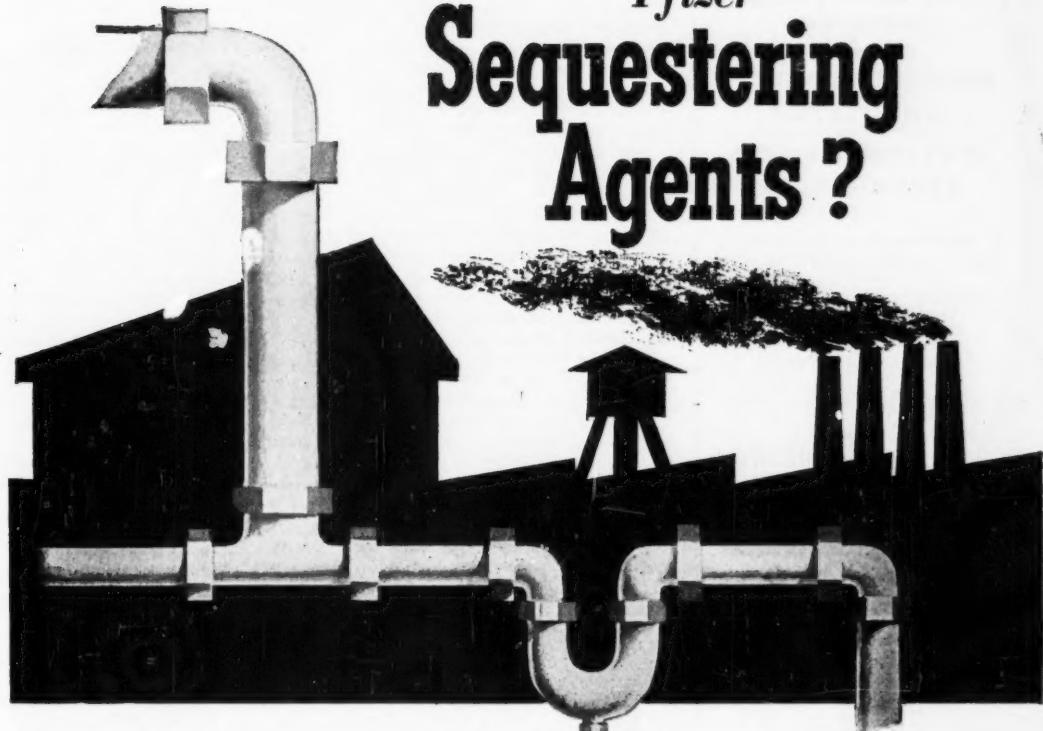
- Quonset huts, interior walls of conventional houses, face-lifting for old buildings.
- Bath tubs, to replace the costly, heavy metal and enamel models of today.

Class and "Class": Another building application, window panes, was considered by William T. Reedy, plastics development manager, Rohm & Haas. Reedy demonstrated that although a pane of acrylic material costs over five times the same size piece of glass, the installation labor costs of each bring the ratio down to only one-and-a-half times. It follows, Reedy pointed out,

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GLUCONIC ACID Sequestering action of 100 parts of acid	Iron (Ferric) 24 Parts Aluminum 4 Parts Copper 26 Parts Zinc 27 Parts Cobalt 6 Parts	7 7 7 7 10



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DISTRIBUTION



BUREAU OF CUSTOMS LABORATORIES have most of the equipment needed to analyze virtually all commodities moving in international commerce. Here, at the control board in the New York lab's spectrographic room, a chemist prepares for his day's work.

Tariffs via the Test Tube

As a nation, America is still in the high-tariff category. And as an industry, chemical manufacturing must credit much of its growth to that customs wall.

One of the essential components in the protective barrier is the customs-laboratory network. Here's what it does, how it works, the effect it has on the chemical industry.



SOME from the collector's office, others from the appraiser's, this is the day's crop of samples to be tested. Here the Organic Laboratory receives its assignments.

Surrounded by the complicated glassware of modern analytical chemistry, a government chemist is this week working on what, to him, is a routine problem: Should the white crystals on his desk—tentatively identified as "fatty alcohols"—remain in the not-elsewhere-classified category and be subject to a 12½% duty? Or does the degree of saturation indicate that it should fall into a higher (or lower) customs classification?

Potentially hanging in the balance, awaiting his purely chemical analysis, are these diverse factors:

- The profit level of the importing company—directly affecting its decision to continue the importation.
- The dollar-earning capacity of the Italian manufacturer.
- The price structure and profits of American firms which make similar or competitive fatty alcohols. Even though the imported quantity may be comparatively small, its effect—in times of easy supply—can have a disruptive effect on the domestic markets.

Collector's Agent: Yet the evaluating chemist cannot take these considerations into his calculations. His job is simply to examine the sample and report his findings to the customs collector.

But despite this organizational set-up, the chemist inevitably finds that



FREQUENTLY performed tests require specialized equipment. This is a bank of distillation units to measure alcohol content.



SAMPLE ROOM is devoted to materials already tested. For safety's sake, they are held until the "protest period" has expired.

his laboratory is a commercial battlefield (see box). The reason: Today's classification system is still based on the Tariff Act of 1930. And because many of the industrially important chemicals which are now moving in international trade were not even known two decades ago, it's largely a matter of judgment to determine their proper classification. For this judgment, the entire Bureau of Customs leans heavily on its trained laboratory staffs.

The Bureau chemists often discover, therefore, that a knowledge of semantics is more important than chemical know-how. Nylon, for instance, can't be found anywhere in the Act's 731 paragraphs; consequently it gives rise to such puzzlers as this: Should wool-like fabrics made from nylon staple be classified as being similar to wool, or should they come into the country as "other synthetic textiles" under the rayon schedule? There is an important difference in duty rates between the two categories.

To make matters more difficult, there are nearly always two or more sharply divergent opinions to be heard. The importer—the man who must pay the duty—naturally wants the tariff to be as low as possible. But an equally vocal argument—aimed at a high duty—can usually be counted on from competing domestic manufacturers. The dyestuff provisions, for example, make a distinction between those that do—and do not—have U.S. counterparts. The importer will there-

Traffic-Cop Chemists

The Bureau of Customs scientist with his sample (see text) is standing—like a traffic cop in the middle of a no-man's-land—at the vortex of a chemical-commerce whirlwind.

In this final week of 1952, it is clear that the last twelve months have witnessed historic developments which spotlight the domestic industry's relationship to the currents of international trade. The events of the year have cast underlying economic forces—heretofore obscured by war, depression, and explosive growth—onto the surface where they form a perplexing pattern of conflicting influences.

The effect has been to put the American chemical industry—now the world's largest and most diversified—squarely on the horns of a dilemma. The 1952 events, and some of the resulting problems:

- A mild mid-year recession made the export markets both more attractive and more valuable. They represent a means of running at full capacity—thereby holding down unit costs. But a growing shortage of dollars in other countries tends to circumscribe these markets—a situation that can most obviously be corrected by lowering America's tariff wall and allowing more dollar-earning products into this country.

- Coincident, however, with the domestic recession has come the resurgence of other chemical industries abroad, mainly those of England and West Germany. The result: foreign chemicals on American markets are not bogeymen of the future, but real and present problems. This has brought forth a groundswell of sentiment to preserve the tariff wall—and even to build it higher.

- As if these conflicting factors were not enough, their combination is even worse. The fact that American chemicals cannot be shipped to dollar-short markets does not mean that the latter's orders will remain unfilled. Instead, the soft-currency chemists of England and Germany are bustling to diversify and expand in order to meet the demand. That, in the future, will make them even greater potential threats to both the domestic American market and its overseas counterparts.

Against these economic, political, and nationalistic crosswinds, the Customs' chemists must maintain a purely scientific detachment. Their single goal: fairly and impartially to interpret the chemically confusing Tariff Act of 1930—allowing the economic chips to fall where they may.

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P 6099 CHEMICAL WEEK

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Autoclaves, Steel, Hor. 66" x 147", First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Cylinders—1,200 Oxygen, 244 Cu. Ft. Capacity, 400 50 lb. CO₂, 1,000 40 Cu. Ft. Oxygen, Round Bottom, Reconditioned and Tested, 200 Foreign Made Oxygen, 250 Cu. Ft. Capacity, Round Bottom, 100 D Size Nitrous Oxide, Filled, 250 Acetylene 12 x 36, 350 50 lb. Freon. Available for Immediate Delivery. All Cylinders listed in Excellent Shape. Dye Oxygen Company, Inc., Migrs., 3332 W. McDowell Road, Phoenix, Ariz.

Dryer, Vac. Shelf 20 shelves, 59 x 78, pump cond. (5), Consol'd Prod., 18 Pk. Row, N.Y. 38.

Dryers, 2 Stainless Drums; 5' x 10', First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Dryers—Rotary, 8' x 54", dir. heat, roll. brngs. Consol'd Prod., 18 Pk. Row, N.Y. 38.

Filter Press, 18" x 18", Sperry, Iron, P & F, 11 Chambers (20), Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 42" x 42", Iron, Shriver, 18, 27, 36, 54 Chambers (12), Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 30" x 30", Aluminum, 45 Chambers, Consolidated Products, 18 Park Row, N.Y. 38.

Filters, all sizes and types. Perry Equipment, 1415 N. 6th St., Phila. 22, Pa.

Kilns, 7' x 60" x 9' 16", roll. brngs. (4) Consol'd rod. 18 Pk. Row, N.Y. 38.

Mills, Taylor tube, 5' x 22", 5' x 20", 4' 6" x 18' 6" 4' x 13", stone lined, pebble charge (4), Consol'dated Products, 18 Park Row, N.Y. 38, N.Y.

Mixers, 700 gal. Turbo, Simplex, Jktd. (2) Consol'd Products, 18 Park Row, N.Y. 38.

Mixer, horiz. ribbon, 14' x 7' 6" x 6', Jktd. 450 cu. ft. Consol'd Prod., 18 Pk. Row, N.Y. 38.

Mills, Day 14" x 30" 3 roll high speed roller (8) Consolidated Prod. Inc., 18 Park Row, N.Y. 38.

Pebble Mills; 8' x 8', Porcelain lined. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Pebble Mills 10 gal. to 800 gal., porcelain lined 20. Consolidated Products, 18 Park Row, N.Y. 38.

Plants—2 Oxygen, Independent 02-B, new, 600 Cu. Ft. per hour, 20-25 meters, complete less power unit—\$7,500 each. 1 Acetylene, Linde, used, 500 Cu. Ft. per hour, complete, ready to run, \$6,500. 1 Oxygen, Air Products, 600 Cu. Ft. per hour, complete, liquid pump type, used, 1.5-Ton Freon Unit, complete, compressor and condensing unit. Dye Oxygen Company, Inc., Migrs. 332 W. McDowell Road, Phoenix, Ariz.

Reactors, Pfaudler Jktd. 400 Ga. First Machinery Corp., N.Y. 13, N.Y.

Tanks—2—2725 gal. tanks; same as above specifications except length—these are 20' long. Tanks were used in milk tank truck services. Can be loaded on trucks at present location or on cars at nearby Railroad siding. Leonard H. Himes, Exton, Pa. Phone—Exton 760.

Tanks, Pfaudler, 500 Gal. SS, Mixing. Process Industries, 305 Powell St., Brooklyn.

Tanks—6—2250 gal-type 18-8 stainless steel 60" Diameter—16" long—20" manhole on top with 3" inlet connection in manhole cover, 3" outlet in rear head at bottom good for 30 lbs. air pressure; 1 1/2" cork insulation, mild steel outer jacket. Most of them recently new insulation. Tank were used in milk tank truck services. Can be loaded on trucks at present location or on cars nearby Railroad siding. Leonard H. Himes, Exton, Pa. Phone—Exton 760.

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fore stress even minor chemical differences, while the American dyemakers strive to prove that their products have substantially equal coloring effects.

Since both have credible arguments to offer, the Bureau chemists must anticipate them, providing their superiors with all available facts on both sides of the question. Because profits and markets are directly at stake, a favorable decision is often worth fighting for to the bitter end. But even if a case is carried all the way up to the Supreme Court, it is usually decided on the basis of the data developed by the Bureau laboratories.

Close Check: These laboratories are scattered strategically around the nation's import-export perimeter. Although the New York lab (where the pictures on these pages were taken) is the largest of the group, similar facilities also exist in Boston, Philadelphia, Baltimore, Savannah, New Orleans, Los Angeles, San Francisco, and Chicago. Moreover, New York has jurisdiction over a branch lab in Puerto Rico; San Francisco has one in Hawaii.

All of these are controlled, from Washington, by Col. John Williams, Chief of the Division of Laboratories. Yet in a sense, they also report to the customs collectors in their districts; the eleven labs handle the work—on a geographical basis—for the 50-odd customs collection districts. There's also close cooperation among the laboratories on methods and developments since some offices have become experts on certain commodities (e.g., Boston is a specialist on wool).

They examine, in all, an import volume valued at \$10 billion a year, and from which the government extracts over \$600 million a year in duties. The New York lab alone, under the direction of chief chemist Edward Kenney, handles an average of 2,000 separate samples a month.

These all arrive at the laboratory from the collector's or the appraiser's offices. Some are sent to the collector by potential importers who want to know the tentative rate of duty before closing a purchase order; others are forwarded by inspectors on the dock or "samplers" working under the direction of the appraiser.

The latter is, by law, the man who determines the value of an imported shipment. He contrasts with the collector, who determines the tariff classification—and thereby sets the rate of duty to be applied against the value as set by the appraiser. The laboratories work closely with both men since the identity of the product is an

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essential factor in both their decisions. Should the importer, usually operating through a customs broker, protest the decision in his case, he can appeal to the U.S. Customs Court, made up of nine judges who act in teams of three while holding court in New York, or individually while on circuit to other cities. If this fails, the case can be appealed to the Court of Customs and Patents Appeals in Washington, D.C., and from there to the U.S. Supreme Court.

Testifying in these court cases is one of the lab men's duties. Sometimes they are judged to be right, sometimes wrong—but only on questions of interpretation, rarely on a question of fact. Meanwhile the tariff chemists keep calling the shots as they see them, leaving it up to Congress and the courts to decide on the shape and height of America's tariff wall.



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OVER FORTY YEARS of continuous publication makes J. T. Baker Chemical Co.'s *Chemist-Analyst* one of the oldest external house magazines in the field of chemistry. But traditions must sometimes give way to modern changes, and this month's issue sports a new cover and major changes in layout and typography.

With an earlier issue tucked under his arm, A. J. Barnard, *Chemist-Analyst* editor, is shown here as he discusses the new style with J. T. Baker's sales v.p., Ralf Clark. The 28-page magazine now goes to 40,000 individuals in sixty countries.

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